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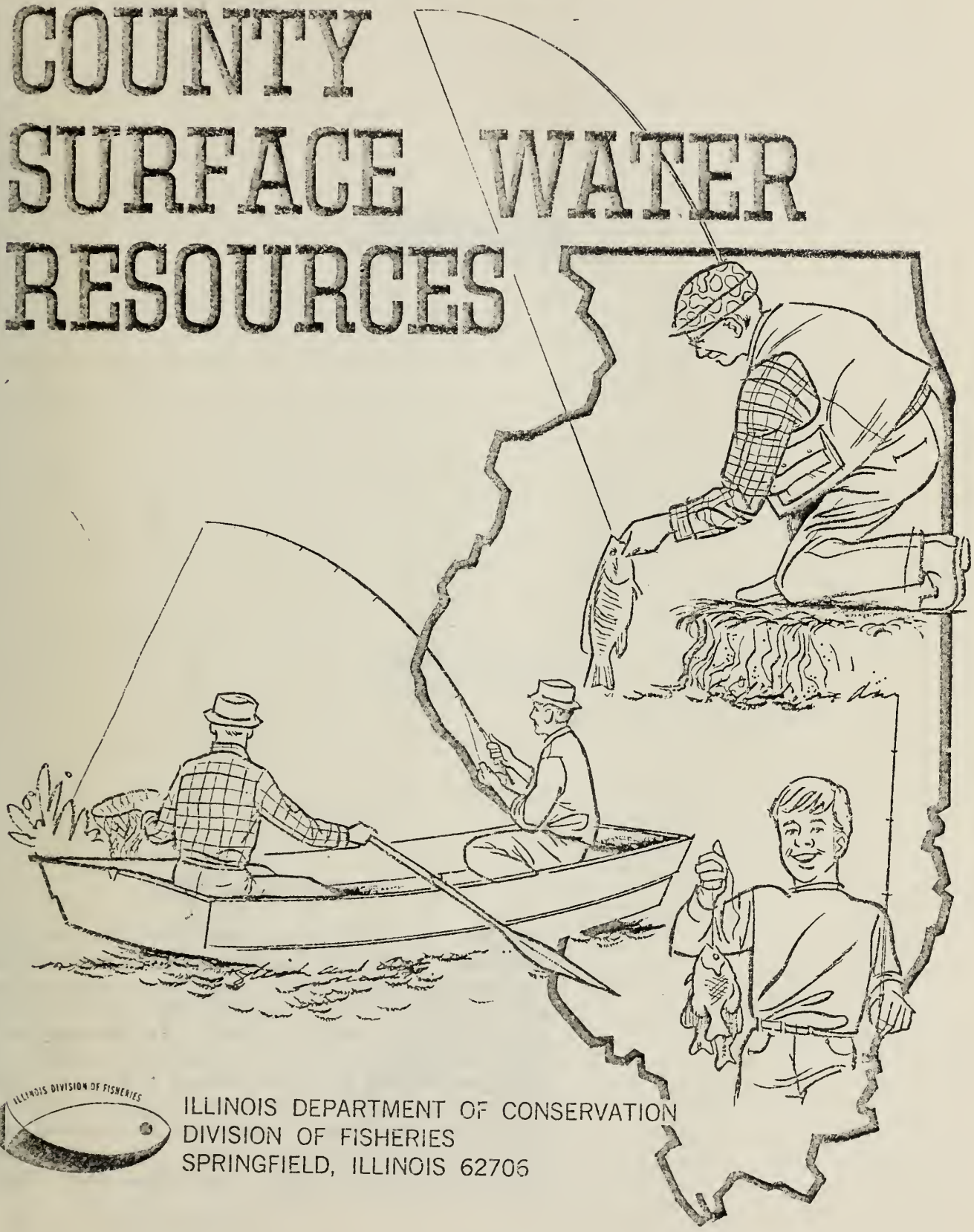

ILLINOIS DIVISION OF FISHERIES

ILLINOIS DEPARTMENT OF CONSERVATION
DIVISION OF FISHERIES
SPRINGFIELD, ILLINOIS 62706

ACKNOWLEDGEMENTS

Data for this report was obtained from information available in the files of the Department of Conservation, and other County and State Agencies associate with Conservation. A special debt of gratitude is owed Mr. Philip Smith, State Fish Taxonomist, for his work in identifying fish collected in 1968. The report was edited by Bruce Muench and Paul Vidal, Area Fishery Biologists, and A. C. Lopinot, Chief Fishery Biologist; and also to Margaret C. Kennedy, who typed the original manuscript. The final manuscript for printing was typed by Helen Theivagt, Typist.

March, 1974

ILLINOIS DEPARTMENT OF CONSERVATION
DIVISION OF FISHERIES

WINNEBAGO COUNTY SURFACE WATER RESOURCES

by

Gregory J. Tichacek
Fishery Biologist

January, 1971

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Natural History

PREFACE

The higher standard of living enjoyed today by Illinois citizens has resulted in an increased amount of leisure time to pursue outdoor recreation. There has been an increased interest in boating, sailing, canoeing, water-skiing, fishing, skin diving, and other water associated sports. Demands by industry, agriculture and urban expansion have also placed heavy burdens on surface waters. It is time to take stock of our existing and potential resources and problems to plan for the future.

A county water resource report, such as this one, is an attempt by the Division of Fisheries of the Illinois Department of Conservation to summarize data on the more important existing water resources and their recreational value. With this data available, a method to apportion usage of water in the best interest of the public can be determined together with the potential needs.

This inventory is an extensive survey of the surface water resources and related items in Winnebago County. Emphasis has been placed on the areas of greatest use and recreational value. The information provided in this report has been obtained from past records on file in the Illinois Department of Conservation, other conservation agencies, and data collected by fishery biologists and fish conservation agents.

In 1964, with the publication of "Illinois Surface Water Inventory", the Division of Fisheries provided the state with the first statistical summary of surface water resources. This was a compilation of waters in each county with no evaluation as to their use. In order to have more complete data available for planning, the Division of Fisheries inaugurated a program in 1966 whereby detailed water resource reports were to be prepared for each of the 102 counties in Illinois.

These reports should assist in long-range planning and development of the states water resources to meet the needs of the future.

A. C. Lopinot
Chief Fishery Biologist

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ABSTRACT

Winnebago County lies in the center of what is known as the "Rock River Hill Country". This area with its gently rolling topography, featuring scattered woodlots, dairy farms, cornfields, morainic ridges and bisected by the scenic Rock River, is a truly beautiful place to live and work. The Northwest Tollway provides the county's residents easy access to both Chicago and the Wisconsin playground to the North.

The present population is 529.2 per square mile and it has been projected to increase to 1676 by 2020. By 1985, the county's population will require an additional 11,600 acres for parks, open space and community facilities. Future growth is predicted to occur along the Rock River Valley expanding radially along arterial roads leading into the city of Rockford. Most of this land will be deducted from present agricultural lands. As of 1970, there were 1,262 farms covering a total of 239,224 acres.

Winnebago County's topography is dissected by 30 permanent streams which have a total length of 281.3 miles and cover a total of 3,116.5 acres. There are a total of 26 lake-size impoundments and 160 ponds which inundate 1,018.5 acres. By combining the totals of both impoundments and streams, a grand total of 216 water areas is arrived at which cover 4,135 acres of 1.2% of the county's land area.

Rockford Township ranks highest with 29 impoundments followed by Pecatonica Township. Laona Township has the largest acreage in impoundments with 316.4 acres. New pond construction in Winnebago County has not kept pace with the rest of Northeastern Illinois in recent years. Since Winnebago County lies in an area which is of older glacial origin, it has very few natural water areas. The exception to this is along the Sugar and Pecatonica Rivers where oxbow development is quite extensive. There is no adequate appraisal of marshland in the county; however, the author estimates that there are approximately 2,600 acres of wetlands scattered throughout the county.

The general water quality of the area is good with certain notable exceptions. Most of the water areas can be classified as fertile, hard and quite productive of aquatic life forms. The county's lakes and streams support primarily warm water fish associations. Such species as walleye and northern pike do occur in Winnebago County, however, they are restricted to the larger streams.

From 44 separate collections, 84 species of fish are known to presently occur. Five rather rare species of fish have been collected in Winnebago County streams: they are the ozark minnow, spottail and weed shiners, northern bullhead minnow and the mottled sculpin. Winnebago County's impoundments generally support a largemouth bass-bluegill fishery and in some cases include northern pike. The county's larger streams support a fishery for catfish and crappie and in some areas, walleye, northern pike and smallmouth bass.

Commercial fishing has been carried out in the county on both the Pecatonica and Rock Rivers on a contract basis for the past 18 years with 601,585 pounds of carp and buffalo being harvested. This represents 13.4% of the total commercial harvest from the Rock River, and the total harvest for the Pecatonica.

The county's surface waters can be classified as having from moderate to heavy usage. Free public access is abundant only along the Rock River. Some access is available on the Kishwaukee, Sugar and Pecatonica rivers and on certain impoundments.

As of April, 1970, there was a total of 6,229.3 public recreational land acres including some 30.5 miles of lake and stream shoreline. County residents at present have 4.1 acres of recreational land per capita.

With the county population projected to reach 400,000 persons by 1985 and 800,000 by 2020, future demands on our existing recreational areas will be much more acute. Close-in sites for lake and park development will be lost if they are not immediately acquired or set aside for that use.

GENERAL SETTING OF THE WATERS IN WINNEBAGO COUNTY

Winnebago County, encompassing a total of 520 square miles, is on the extreme western fringe of what has been termed the "Northeastern Illinois Metropolitan Area," and is rapidly becoming the focus of a "North Central Illinois Metropolitan Area". Metropolitan Rockford is increasingly being identified as a portion of an urban network which in the future will connect Chicago and Madison, Wisconsin (Whitehead et al. 1964). This dynamic region is the most rapidly developing area in Illinois, and the second fastest developing region in the whole country (Bartholomew et al. 1966).

Winnebago County's eastern boundary, which it shares in common with Boone County, is roughly 58 miles west of Lake Michigan and another 23.5 miles west is its western boundary which is adjacent to Stephenson County. The northern boundary is the state line between Illinois and Wisconsin and is in contact with portions of Wisconsin's Green and Rock counties. Some 24 miles to the south, the county shares a common boundary with Ogle County.

Most of Winnebago County's unincorporated land is devoted to some form of agriculture (246,585 acres). Included under this classification are 15,500 acres of woodlands, which are mostly a mixture of the Oak-hickory and Oak-maple associations.

High value minerals are not one of the important area resources, however, there are extensive sand and gravel deposits along the Rock River Valley and scattered limestone out croppings throughout the county. Major (1967) reports that as of 1966, there were seven active sand and gravel pits, and fourteen operating quarries, the combined production of which was 2,438,871 tons with a value of $2,669,220.00 in 1968 ranking the county 44th in the state for that year.

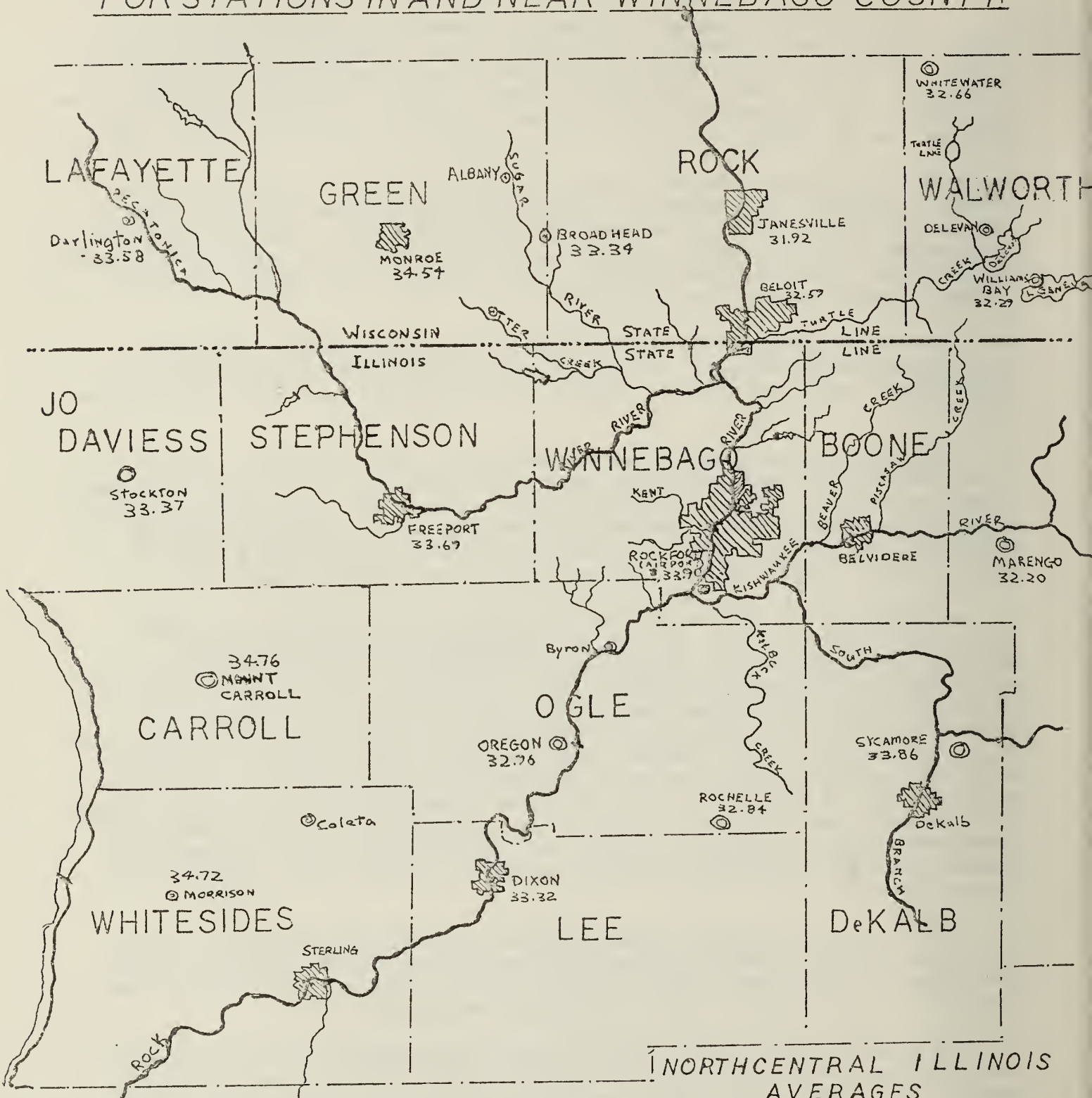
According to the city-county planning commission, the county's population will reach 275,974 in 1970. As of 1967, Winnebago County placed third and Rockford second in the state on the basis of population. Most of the urbanization and industrial development has taken place in and around the city of Rockford, although in recent years there has been industrial growth in Loves Park, South Beloit, Pecatonica and around Roscoe. The majority of the county's industries are light to moderate in size, however, roughly one-third the industrial community would have to be classified as heavy. Winnebago County's industries manufacture a wide variety of products which run from aero-space components to yogurt, including such things as bakery and dairy products, knitting yarns, furniture, paper board containers, paints, varnishes, rolled steel, cutlery, hand tools, farm machinery, special industrial machinery, household appliances, screws, bolts, hardware and aircraft parts.

Until recently, new home construction has been centered around the fringes of Rockford. In the past few years, wooded and lakeside subdivision developments have begun to boom in the county; the most recent of which is the 3,000 lot, Lake Summerset site, presently under construction near Durand.

The primary agricultural land-use is cash grain farming with corn leading the list in acreage, followed closely by soybeans, hay and small grains (Assessors' Annual Census 1969). Beef cattle raising is one of the most important livestock activities on Winnebago County farms, followed by dairy cattle and hogs. In 1966, the county's farms produced 131,500,000 pounds of milk and 21,140,000 eggs.

FIGURE 1

LONG TERM MEAN ANNUAL PRECIPITATION FOR STATIONS IN AND NEAR WINNEBAGO COUNTY.



NORTHCENTRAL ILLINOIS AVERAGES
33.02 INCHES PER YEAR

SOURCE OF DATA: U.S.D.A. YEARBOOK 1941 "CLIMATE AND MAN"

PHYSIOGRAPHY

Winnebago County lies entirely in the physiographic division known as the Rock River Hill Country of the Till Plain section of the Central Lowland Province. Leighton (et al. 1948) describes the Rock River Hill Country as being characterized by subdued rolling hills in a state of late youth to early maturity. This area includes the eroded Illinoisan drift plain north of the Shelbyville moraine and Meredosia Valley, and also includes a fringe of early Wisconsinan drift, which lies west (Boone County) of the Marengo Ridge Moraine. According to Leighton, the Illinoisan drift is not very thick throughout most of the district, and is not known to be underlain by any older drift, therefore, the present relief is said to follow the basic bedrock pattern for the area. Most of the area of Illinoisan drift has little or no morainal construction and, therefore, ridges and hills are of a localized nature. The stream valleys which occur in this area, are relatively broad, steep walled, and have terraces which are remnants of alluvial fill deposited following the retreat of the glaciers.

Winnebago County has quite a few intermorainal hills of sand and gravel known as "kames", and ridges of the same material known as "eskers". The eskers are much more abundant in the county and are the source of much of the presently produced gravel (Hopkins 1916). The depth of drift in Winnebago County varies widely being the thinnest in the northwestern corner, an area which has much exposed limestone. East of the Rock River, this drift becomes over 300 feet thick.

The only remnant of a morainal ridge is the White Rock moraine, which enters the county from the east at approximately U.S. Route 20, dips slightly to the south, and leaves the county in section 31 of southwest Rockford township. This moraine, which represents the terminus of the western edge of the Wisconsinan glacial lobe, filled in the old stream valley of the Rock River, which at that time flowed eastward out of Winnebago County to the DeKalb County line, and then back toward the west, where it entered the old Mississippi River in what is now Bureau County. The deposition of the White Rock moraine changed the course of the Rock River to its present location (Anderson 1967). During the same period, the course of the Mississippi River was also changed, and following the retreat of the glaciers, much of the sand and gravel which presently occurs along the Rock River was deposited.

Although Winnebago County is generally flat to slightly rolling, the relief becomes greater in the northwest and northeast. The uplands above the east slope of the Rock Valley Terrace represent the west slope of the Troy Valley, which runs diagonally through Boone and the east one-third of Winnebago County, following the general path of the White Rock moraine. Below the mouth of the Kishwaukee, the Rock River has cut into a post-Illinoisan rock gorge, which becomes more predominant as one approaches Oregon, Illinois. The Illinoisan glaciation covers that part of the county north of the Pecatonica River and west of the Sugar River (Figure 5).

The ancient Rock River was at one time from 200 to 300 feet below its present stream bed. At the close of the Wisconsinan glacial period, the Rock River valley was rapidly filled with glacial drift.

In the Pecatonica Valley, silting was not as rapid, resulting in a "ponding effect" which created a lake, said to have extended almost to Freeport. Due to this lake's formation, large quantities of lacustrine deposits were laid down in this area. After the new Rock River had cut approximately 30 to 60 feet down through the bed of deposited material, Lake Pecatonica was drained, and the new Pecatonica River has since cut a 10 to 20 foot channel through the deposits.

The highest point in the county is 900 feet M.S.L. in the northeast, in Roscoe township, near the Boone County line. The lowest point occurs where the Rock River leaves the county, in Section 19 of the southwest of Rockford Township, and is 685 feet above mean sea level. The average elevation of the county is 838 feet M.S.L. The northern half of the county seems to average 750 feet above sea level, while the southern half would closely approximate the county average of 840 feet M.S.L. Using the minimum and maximum elevations, we find the county to have a total relief of 305 feet.

CLIMATE

The climate of extreme north central Illinois, including Winnebago County, is classified as continental featuring warm summers and cold winters, with a wide temperature variance between the two. Table 1 presents the average yearly climatological data for stations in and surrounding Winnebago County. The Rockford weather bureau is located on the property of the Greater Rockford Airport, in the southeast corner of the county. The readings of the weather station in Beloit, Wisconsin, would closely approximate the climatological conditions for the northern half of Winnebago County and the one in Freeport for the western fringe. Table 2 presents temperature and precipitation data compiled by William Denmark, the Illinois State Climatologist. According to Mr. Denmark's records, the mean annual precipitation is 35.62 inches, and ranges from 22 inches in dry years, to 47 inches in extremely wet years. This data compares favorably with information contained in Figure 1, which shows that the north central region of Illinois averages 33.02 inches per year. The mean annual runoff for the Rock River Basin is recorded at 8.94 inches for a station located at Como, south of Sterling. All of the runoff for Winnebago County is included in this figure, as the total surface drainage enters the Rock River via its tributaries (Jones et al. 1966). Most of the precipitation (23 inches) reaches the county during its average 163 day growing season, which extends from mid-April to late September. This period is also the time of the highest rates of evapotranspiration, which in the Rockford area averages 24.5 inches yearly (Thornwaite 1948). Moderately prolonged dry periods are common to Winnebago and surrounding counties. This is an important consideration in the management of the county's water areas for fishing, and is one of the prime reasons that the Division of Fisheries requires areas stocked by it to be at least nine feet deep in one-quarter of the surface area.

Most of the summer precipitation occurs in the form of short duration showers and thundershowers. The climatic summary for Rockford shows that the greatest amount of rainfall in 24 hours was 2.5 inches. As can be seen in Table 2, the possibility does exist for rains exceeding four inches to occur during the summer months, however, this is not very common.

Winter precipitation varies considerably from year to year, but would tend to average 33.4 inches of snow and sleet in combination from late October to early April. The average length of the winter period, that being defined as the number of days during the year when the temperature does not exceed 32°F., is recorded at 157 days. The average date for this to occur in the spring is April 30, and in the fall, October 4.

Data is not available for the heaviest recorded snowfall; however, the Rockford climatological summary (Denmark 1966) shows that the Rockford metropolitan area has on occasion received up to 61 inches of snow, and at least nine years during the past 37 has received over 40 inches of snowfall. Snow covers exceeding 12 inches are not uncommon.

STATIONS	Temperature			Precipitation		
	Mean Monthly	Extremes Low	Extremes High	Mean (inches)	Days with 0.10 inch	Mean snow (inches)
Beloit	49.5°F	-24°	110°	32.64	62	31.4
Dixon	49.3°F	-27°	110°	33.32	66	32.9
Freeport	47.8°F	-29°	112°	33.90	63	33.6
Janesville (Wis)	48.6°F	-28°	101°	31.92	60	32.7
Lake Geneva (Wis)	48.1°F	-23°	101°	33.10	65	43.1
Marengo	47.0°F	-27°	109°	32.89	68	31.6
Rockford (Airport)	48.6°F	-25°	103°	35.69	62	33.4
Sycamore	48.7°F	-26	109°	35.22	71	30.4
Whitewater (Wis)	47.9°F	-37°	101°	32.66	63	44.0
Williams Bay (Wis)	48.7°F	-29°	110°	32.29	65	39.7
Averages for area...	48.3°F	-26.5°	105°	33.27	64.8	33.7

Source of data - U.S.D.C.-W.B. Publication Climatography of the U.S., No. 86.9 (Illinois) and No. 86-41 (Wisconsin), Supplement for 1951-1960, Washington, D.C. 1964-65

Table 1. - AVERAGE YEARLY CLIMATOLOGICAL DATA FOR STATIONS IN AND NEAR WINNEBAGO COUNTY

MONTH	Temperature (Degrees Fahrenheit)				Precipitation (Inches)			
	Mean daily max.	Mean daily min.	Highest recorded (71 yr.)	Lowest recorded (71 yr.)	Mean monthly total	Greatest daily precipitation	Mean monthly snowfall	Max. monthly snowfall
January.....	30.2	13.7	55.0	-25.0	1.98	2.89	8.8	21.4
February.....	32.7	16.1	55.0	-16.0	1.44	1.73	5.4	19.5
March.....	42.9	25.1	73.0	-2.0	2.46	1.70	8.1	22.7
April.....	58.7	36.9	83.0	22	3.05	3.03	0.6	4.4
May.....	70.5	47.7	87.0	24.0	3.83	2.55	0	1.0
June.....	80.9	58.4	94.0	42.0	3.43	3.22	0	0
July.....	86.3	62.1	112.0	47.0	4.14	5.03	0	0
August.....	84.2	60.8	93.0	43.0	4.14	2.20	0	0
September.....	75.6	52.0	90.0	33.0	3.51	5.56	0	0
October.....	64.1	40.9	90.0	24.0	2.70	5.22	T	1.1
November.....	46.1	28.0	74.0	3.0	2.37	3.20	2.6	14.7
December.....	33.5	17.7	56.0	-20.0	1.70	1.91	7.7	18.4
Year.....	58.8	38.3	112.0	-25.0	35.62	5.56	33.4	22.7

[a] Data prepared by W. Denmark, Illinois State Climatologist, U.S. Weather Bureau-Urbana, Illinois-1965.
[b] T = Trace

Table 2.-SELECTED TEMPERATURE AND PRECIPITATION DATA, WINNEBAGO COUNTY

When winter northeasterly winds blow across Lake Michigan, cloudiness often is increased in the Winnebago County area and temperatures are somewhat higher than those further west near the Mississippi River. Conversely, in the summer the winds off the lake sometimes have a cooling effect on the Rockford area. The average relative humidity for the Winnebago County area would approximate 70 percent. Wind direction during summer months is south-southwest and changes in October to northwest with the most noticeable easterly winds coming during the months of March and May. Wind speeds average 10 m.p.h., however, there are a number of days on which they reach 20 m.p.h. The average year includes approximately 96 days of clear weather, 105 days of partly cloudy weather, and 164 days of cloudy or overcast weather (Denmark 1966).

The county's water areas are normally icebound from early December to late March. Ice thickness during severe winters has been known to build up to 36 inches in northern Illinois, although it usually averages from 14 to 18 inches according to Illinois Division of Fisheries records.

GEOLOGY

The recent geologic history of Winnebago County can be traced directly to the general southwesterly movement of the Wisconsinan, Illinoisan and possibly the Kansan glaciers of the Great Ice Age (Pleistocene Epoch). The unconsolidated materials deposited by the glacial invasions are thin or locally absent on the uplands. In these areas, usually, only glacial till and loess were deposited and are thickest. Hacket (1960) states that glacial deposits are more than 200 feet thick in the major stream valleys where sand and gravel outwash was left by meltwater, following the retreat of the ice sheets. The Paleozoic bedrock formations under Winnebago County feature a well developed pre-glacial drainage system which had been eroded into the bedrock surface nearly 400 feet below the present land surface.

Figure 3 shows that most of the valleys and uplands are underlain by a bedrock surface which is primarily of Ordovician Age, however, at South Beloit, on the northern edge of the county, east of the Rock River, in the vicinity of Turtle Creek, the stream has penetrated to the Trempealeau dolomite of the Cambrian Age. Most of the Paleozoic rock lying under Winnebago County is composed of consolidated, stratified sediments deposited in shallow epicontinental seas which inundated this part of North America during earlier geologic periods.

Data from over 600 wells and test borings have provided the information for the construction of Figure 2, which is a reproduction of a vertical boring down through the rock layers which lie beneath the county. Our information concerning the existence of the several invasions of prehistoric seas over much of Illinois and the North American continent, is derived primarily from these borings.

If we start with the Pleistocene glacial deposits, and proceed downward through the Ordovician rock, the most recent layer we come in contact with is the Decorah-Galena-Platteville dolomite. The Maquoketa Formation, prominent east of Rockford, and all rock formed since then, has been removed by pre-glacial erosion, and the advance of the glaciers, therefore this portion of the geologic record is not available for the county. The Galena-Platteville dolomite becomes 276 feet thick in the vicinity of Rockford, and this thickness varies considerably over the county. This rock formation is a mixture of fine light grey, yellowish grey, or brown dolomite, which is primarily cherty in the layers and grades out to dolomitic sandstone at the base.

FIGURE 2.

A VERTICAL STRATOGRAPHIC COLLUM THRU THE BEDROCK BELOW WINNEBAGO COUNTY

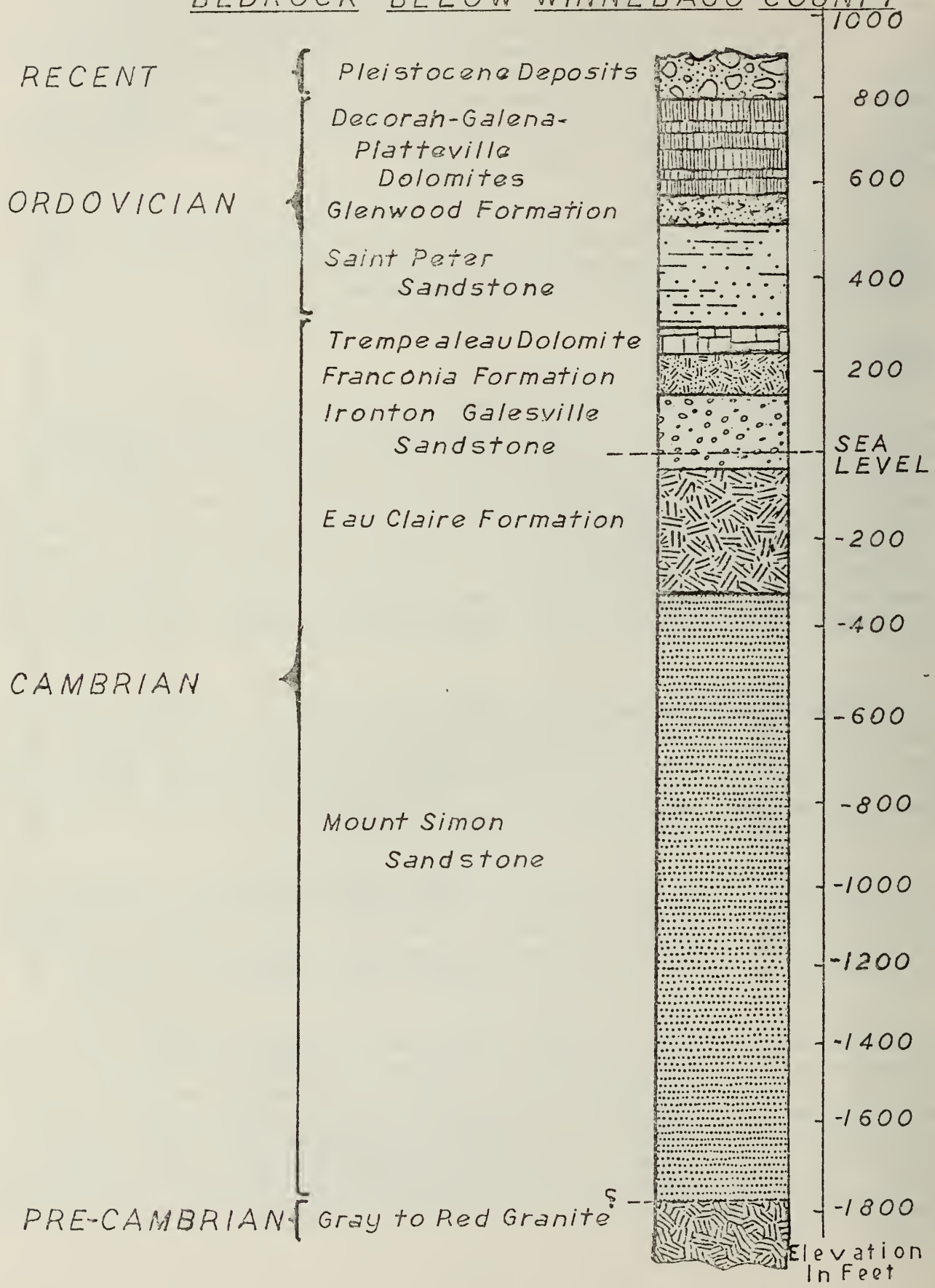
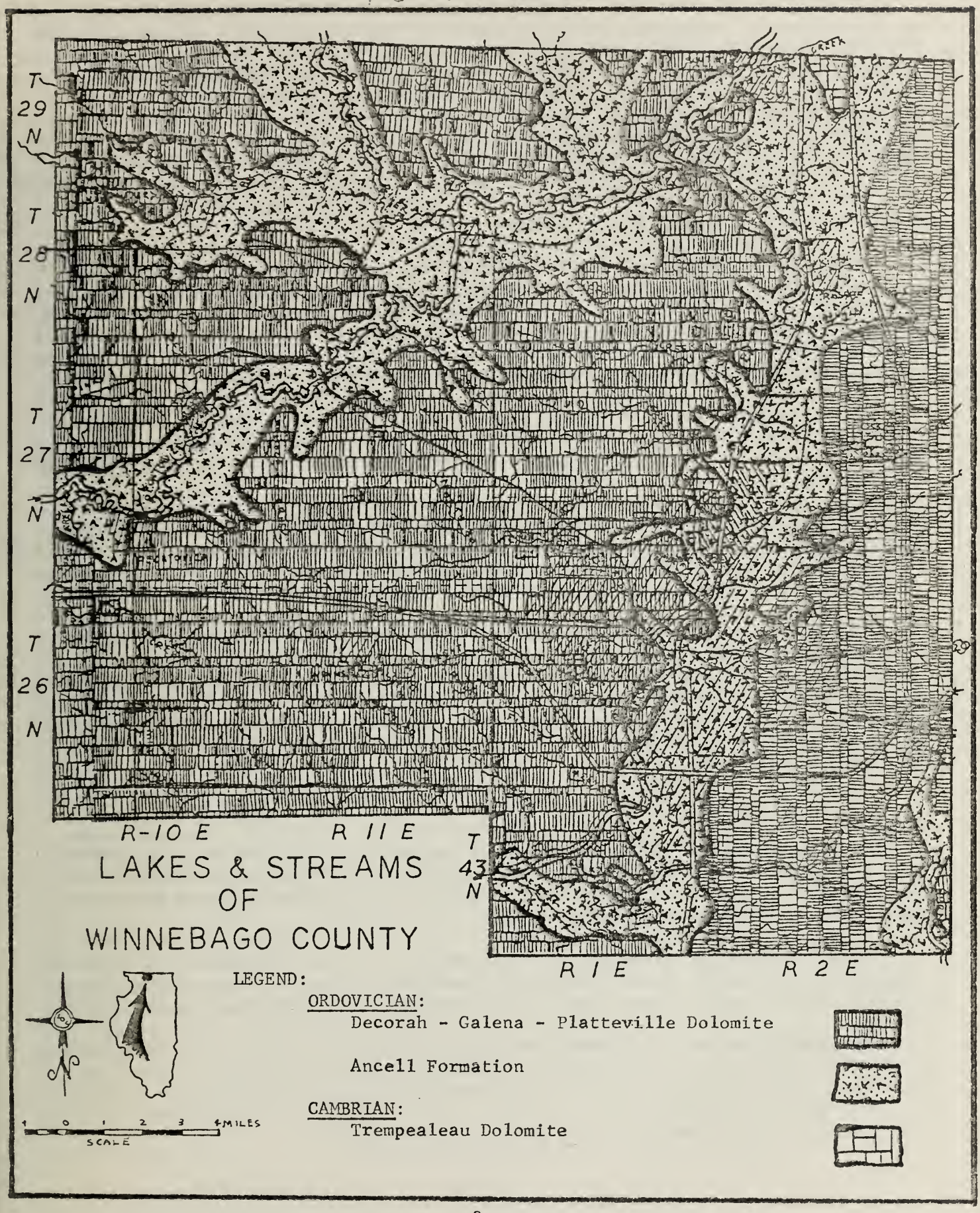


Figure 3. BEDROCK GEOLOGY



Underlying the Galena-Platteville dolomite is a rock strata commonly referred to as the Ancell Formation. Included in this formation are two types of rock, the Glenwood Formation and St. Peter Sandstone. The St. Peter Sandstone was deposited during a period when the St. Peter Sea inundated Northern Illinois, and was followed by an interval of retreat and reflooding known as the Glenwood Period. The St. Peter Sandstone covers most of the county, being primarily exposed in the stream channels of the Rock, Sugar, and Pecatonica rivers (Figure 3). The average thickness of this rock layer in Winnebago County is about 265 feet. The Glenwood Formation is generally a thin layer which seldom exceeds 10 feet, reaching a maximum thickness of 60 feet southeast of Rockford, lying buried under the Galena-Platteville dolomite over most of the county.

Below these Ordovician deposits, there are several layers of Cambrian rock, including Trempealeau dolomite, the Franconia Formation, Ironton-Galesville Sandstone, the Eau Claire Formation, and Mt. Simon Sandstone. The most recent of these, the Trempealeau dolomite, is characterized by a predominate pink color, and finely crystaline structure. This dolomite reaches a thickness of 100 feet in the vicinity of Rockford and is exposed near South Beloit.

The Franconia Formation varies from 60 to 95 feet thick, and is a mixture of interbedded sandstones and shales, with some dolomite. It is thought to have been formed at a time when the sea was shallow, and the bottom sediments were occasionally exposed as tidal flats (Templeton 1952).

The Ironton Galesville Sandstone has a maximum thickness of around 170 feet, and is thought to have been laid down at a time when the shallow seas were receiving fine to medium grained sediments from the border land area. This sandstone is one of the principal bedrock aquifers underlying Winnebago County (Hacket 1960).

The Eau Claire Formation is thought to have been laid down during a period when marshlands were predominant, featuring water stagnation, and abundance of organic matter and bacterial action. The average thickness of this layer is about 400 feet. The composition of this rock is quite variable, from silt to shale, including some sandstone in the basal areas. Geologists feel that the deposition of this sandy dolomite indicates a change in environmental conditions, at the beginning of this era.

Mt. Simon Sandstone is the earliest Cambrian Formation found under Winnebago County. It consists of a poorly sorted shale and red and white sandstone. This formation attains a maximum thickness of 1,600 feet in the southeast corner of the county. The Mt. Simon Seas received the runoff of a larger river, draining the continental area north of Illinois, and discharging into the sea, just north of Belvidere, in Boone County.

This continental region to the north was underlain with a granite bedrock of low relief. There was a red clay mantle developed on top of this bedrock, which sluffed off to form the lower most, fine clay deposits of the Mt. Simon Formation.

The Pre-Cambrian rocks, which occur below Winnebago County, have been found to be generally gray to red, medium to coarsely crystalline granite. This Pre-Cambrian surface is said to drop 45 feet to the mile in a southeasterly direction. The Pre-Cambrian surface at South Beloit is about 1,200.0 feet below sea level, or approximately 2,000 feet below the present land surface.

Remains of various prehistoric animals have been found throughout the county. The most recent find of significance occurred in 1964, when during the construction of a house in North Park, bits of ivory and teeth of a Woolly Mammoth were exhumed. Mammoth teeth have also been found in the vicinity of Winnebago. In 1963, Pre-Ice Age elk and deer antlers were found in the vicinity of Middle Creek, southwest of Winnebago. The jaw of an ancient bison was uncovered in the same area. Approximately 20 years ago, fragments of a mastodon tusk were found in the vicinity of Kilbuck Creek, near Cherry Valley. Various artifacts and bones of Winnebago Indians have been exhumed in the Sugar River Valley. Many of the above mentioned items are on display at the Burpee Natural History Museum in Rockford.

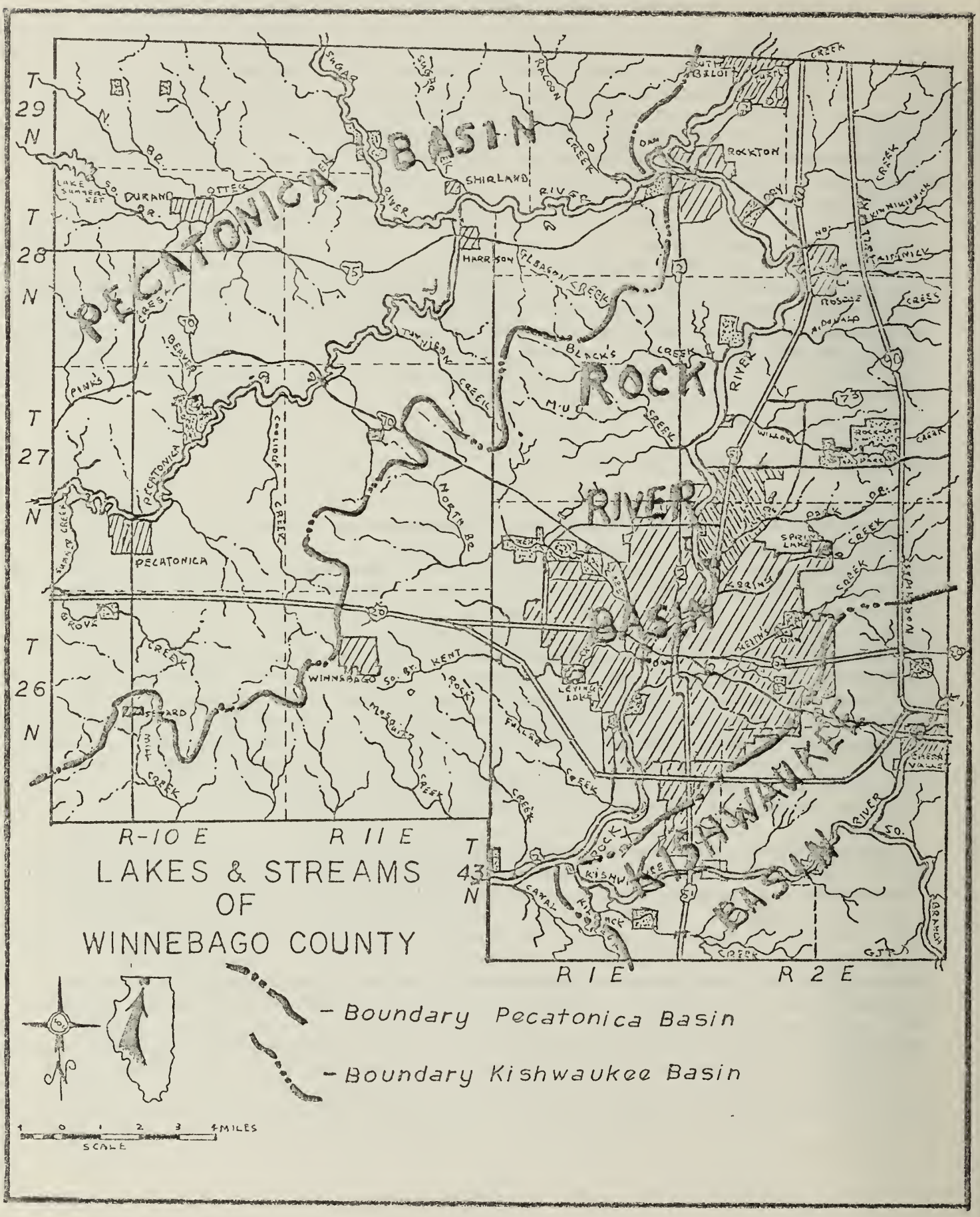
Due to its geologic history, certain factors influence the ability to establish surface water impoundments in Winnebago County. A basic consideration, in this respect, is the fact that the general geologic pattern of this portion of Illinois features bedrock which tends to have fractures or contains porous material which can cause leakage from a reservoir. This problem, to a small degree, has occurred at Rock Cut State Park, where we have had a leakage problem on the north edge of the dam. Another feature of the sub-surface geology, which could also cause serious leakage problems, is that much of the unconsolidated matter over the bedrock and contained in stream valleys, has continous sand and gravel deposits (Dawes and Tersteriep, 1967).

DRAINAGE

The surface drainage of Winnebago County is in a general east-west direction, eventually entering the Rock River, which runs due south, through the east central portion of the county. The Rock River enters from the north in South Beloit and leaves the county just southwest of New Milford on the Ogle County line in Section 19 of Rockford Township. The county lies entirely in the Rock River drainage basin. This stream, with its two major tributaries, the Kishwaukee and Pecatonica rivers, forms a major drainage basin, into which all the feeder streams eventually discharge. The Pecatonica River enters Winnebago County one mile east of the village of Pecatonica, and flows in a general northeasterly direction to its confluence with the Rock River in Rockton. The North Branch of the Kishwaukee River enters the county on the eastern border 0.75 mile north of Cherry Valley, and the south branch enters the county at the extreme southeastern tip and flows northward to its confluence with the north branch in Section 15, of Cherry Valley Township (Perryville Road). From this point, the main stream flows in a due west direction to its confluence with the Rock River, 1.5 miles south of the Greater Rockford Airport, on Kishwaukee Road.

The southeast corner of the county drains diagonally into the Kishwaukee River via its major tributary, Kilbuck Creek. The breaking point for this drainage on the Boone County line is Rote Road. Starting at this point, the basin runs diagonally to the southwest in a line just north of the Greater Rockford Airport. The breaking point on the Ogle County line is Friday Road, running diagonally northwest to the mouth of the Kishwaukee River (Figure 4). West of Winnebago, and diagonally north to Rockton, the drainage is to the Pecatonica River via its major tributaries, Otter, Raccoon, Coolidge, Pink, Summer, Grove, Tunnison, and Gleason Creeks, and its major tributary, the Sugar River. The breaking point for this drainage basin on the west border is Murphy Road, and on the north border is Prairie Avenue in Section 3 of Rockton Township.

FIGURE 4 - DRAINAGE BASINS



The remainder of the county drains directly into the Rock River via Dry, Willow, Blacks, Mud, Kent, Rock, Canal, Keith, Spring, Turtle, Mill and Mosquito creeks.

The surface drainage which enters the Pecatonica River comprises roughly one-half of the county. Of the remaining half, roughly 35 percent drains directly into the Rock River. The county's major impoundments, Pierce, Levings and Lake Summerset lie on Willow, South Branch of Kent and the South Branch of Otter creeks respectively.

SOILS

The present soils of Winnebago County were derived from parent materials, which were distributed by three physical agents: ice, water and wind. By continental glaciation immense quantities of debris were brought into and deposited, irregularly over the surface of the county, however, these materials do not constitute the present soils over any large area. The Illinoisan drift in the northwestern part of the county was subsequently covered by wind blown (loess) material, which varied in depth from five to seven feet. Thompson (1970) states that early Wisconsinan drift in the southern and eastern parts of the county was covered by loess to a depth from three to six feet.

The commonly accepted theory is that during the retreat of the Wisconsinan glacier, large quantities of rock flour were deposited over the various flood plains by melt water. When this material was dry it was carried by the winds and redeposited over much of the county as loess. Post-Wisconsinan loess does exist, however, its distribution is both thin and irregular.

The Rock River terrace was formed largely by the deposition of Wisconsinan sand and gravel outwash (Figure 5). This area has since been covered with a shallow layer (1 to 5 feet) of silty, sandy mixed loess and alluvium. Hopkins further states that this terrace is so porous that most streams originating in the uplands sink into the porous gravel before reaching the Rock River. This is especially true of Dry and Willow Creeks.

The Pecatonica terrace was formed by the deposition of lacustrine deposits in glacial Lake Pecatonica. This lake, when drained, left a surface which was later buried by loess, and now constitutes the soil. The valleys of the Sugar River and Raccoon Creek are filled with sandy Wisconsinan outwash. The soils of the uplands of both Rockton and Shirland townships are comprised largely of sandy loess and many dunes occur especially in the vicinity of Yale Bridge.

Of the 35 soil groups recorded for Winnebago County in the 1916 publication, nine cover more than 85 percent of the total land area, and three of these cover over 50 percent of the count as indicated in Table 3. These soil types (Figure 6) can be placed into 15 broad associations based on similarities in drainage, color, textures and slope, and can be further lumped into five general soil areas in respect to developmental differences.

KEY TO FIGURE 5 - SOIL PARENT MATERIALS

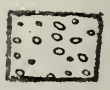
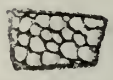
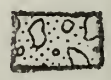
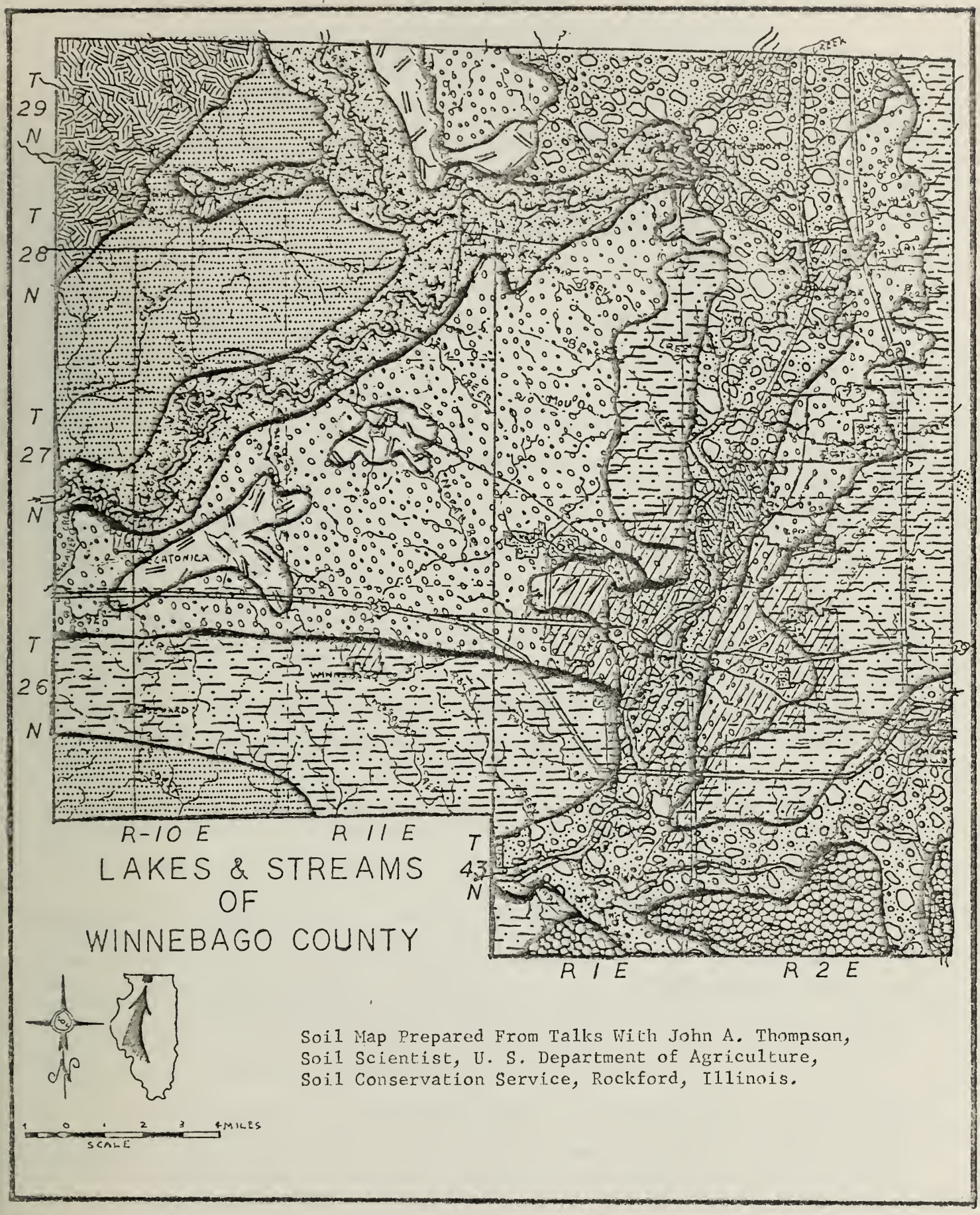
1. THICK LOESS OVER OGLE TILL - - - - - - - - - - - - - - 
2. THIN LOESS OVER EDMUND TILL - - - - - - - - - - - - - - 
3. THIN LOESS OVER ARGYLE TILL - - - - - - - - - - - - - -
4. LOAM AND SANDY LOAM OVER ARGYLE TILL - - - - - - - - - -
5. LOESS AND DRIFT OVER BEDROCK - - - - - - - - - - - - - -
6. THIN LOAM TO SANDY LOAMS ON BEDROCK - - - - - - - - - -
7. SILTY TO SANDY TERRACE OVER LOOSE SAND AND GRAVEL - - - 
8. RECENT ALLUVIUM -

FIGURE 5 SOIL PARENT MATERIALS



Soil Map Prepared From Talks With John A. Thompson, Soil Scientist, U. S. Department of Agriculture, Soil Conservation Service, Rockford, Illinois.

TABLE 3

A PERCENTAGE AND AREA COMPARISON FOR THE SOIL GROUPS OCCURRING IN WINNEBAGO COUNTY, ILLINOIS

Type No.	Type Name	Area In Acres	Percent of Total Area
	Upland Prairie Soils		
626 726 626.5	Brown silt loam	70 451	21.35
726.5	Brown silt loam on (1) rock	64	.03
620 720	Black clay loam	691	.21
628 728	Brown-gray silt loam on tight clay	762	.23
660 760	Brown sandy loam	63 040	19.10
760.5	Brown sandy loam on rock	4 544	1.38
781	Dune sand	1 952	.60
	Upland Timber Soils		
634 734	Yellow-gray silt loam	53 235	16.13
635 735	Yellow silt loam	16 250	4.92
635.5	Yellow silt loam on rock	2 694	.82
632	Light gray silt loam on tight clay	198	.06
764	Yellow-gray sandy loam	15 303	4.63
764.5	Yellow-gray sandy loam on rock	1 242	.38
665 765	Yellow sandy loam	2 272	.69
765.5	Yellow sandy loam on rock	1 133	.34
690 790	Gravely loam	3 942	1.19
	Residual Soils		
698 798	Stony loam	1 440	.44
799	Rock outcrop	13	.003

TABLE 3 CONTINUED

Type No.	Type Name	Area in Acres	Percent of Total Area
	Terrace Soils		
1520	Black clay loam	1 331	.40
1526	Brown silt loam	3 040	.92
1527	Brown silt loam over (2) gravel	3 763	1.14
1528	Brown-gray silt loam on tight clay	1 568	.48
1532	Light gray silt loam	4 211	1.28
1536	Yellow-gray silt loam over gravel	3 584	1.09
1560.3	Brown sandy loam on gravel	11 616	3.52
1564	Yellow-gray sandy loam	1 383	.42
1566	Brown sandy loam over gravel	22 035	6.68
1581	Dune sand	467	.14
	Late Swamp and Bottom-Land Soils		
1401	Deep peat	1 428	.43
1402	Medium peat on clay	275	.08
1402.2	Medium peat on sand	173	.05
1403	Shallow peat on clay	51	.02
1410.2	Peaty loam on sand	2 835	.86
1450	Black mixed loam	11 066	3.35
1454	Mixed loam (bottom land)	21 971	6.64
	TOTAL	330 023	100.00

(1) "On" signifies that the gravel or rock is less than 30 inches below the surface; (2) "over" that it is more than 30 inches.

* Source of data - Hopkins, E. C., et al. 1916 - Winnebago County Soils - Soil Report #12, U. of Illinois Agricultural Experimental Station, Urbana, Ill.

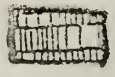
The first general soil area consists primarily of soils developed under upland prairie, grass vegetation, and as such are high in organic content. These soils are deep, moderately permeable, dark colored, have medium to moderately fine textured subsoils. In this classification, we find the Downs-Durand-Winnebago, Ogle-Tama, Varna-Andres, and Wea-Plano-Proctor Associations. Figure 6 shows that of these associations, the Downs-Durand-Winnebago is the most wide spread in occurrence, and one of the most predominant in the county. The least wide spread of this complex is the Varna-Andres Association that occupies the uplands south of the Kishwaukee River and along the Ogle County line.

The second general soil area features soils developed under an upland timber canopy and as such are somewhat less fertile. The timber soils are deep, moderately permeable, light colored, and have a medium textured surface soil, underlain by brownish, reddish brown or mottled, moderately fine textured subsoil. Included in this classification are the Flagg-Pecatonica-Westville, Fayette-Flagg, and Camden-

KEY TO FIGURE 6 - BROAD SOIL ASSOCIATION OF WINNEBAGO COUNTY

1. DOWNS-DURAND-WINNEBAGO - - - - - - - - - - - - -

2. OGLE-TAMA -

3. VARNA-ANDRES - - - - - - - - - - - - - - - - - - - 

4. WEA-PLANO-PROCTOR - - - - - - - - - - - - - - - -

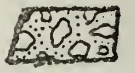
5. FLAGG-PECATONICA-WESTVILLE - - - - - - - - - - -

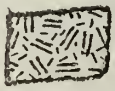
6. FAYETTE-FLAGG - - - - - - - - - - - - - - - - - -

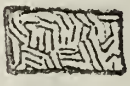
7. CAMDEN-ST. CHARLES - - - - - - - - - - - - - - -

8. WOODBINE-DUNBARTON - - - - - - - - - - - - - - -

9. HITT-EDMUND - - - - - - - - - - - - - - - - - - -

10. WARSAW-LORENZO - - - - - - - - - - - - - - - - - 

11. SPARTA-DICKINSON-LAMONT - - - - - - - - - - - - 

12. LAMONT-WESTVILLE-SOGN - - - - - - - - - - - - - 

13. OTTER-MILLINGTON - - - - - - - - - - - - - - - -

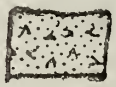
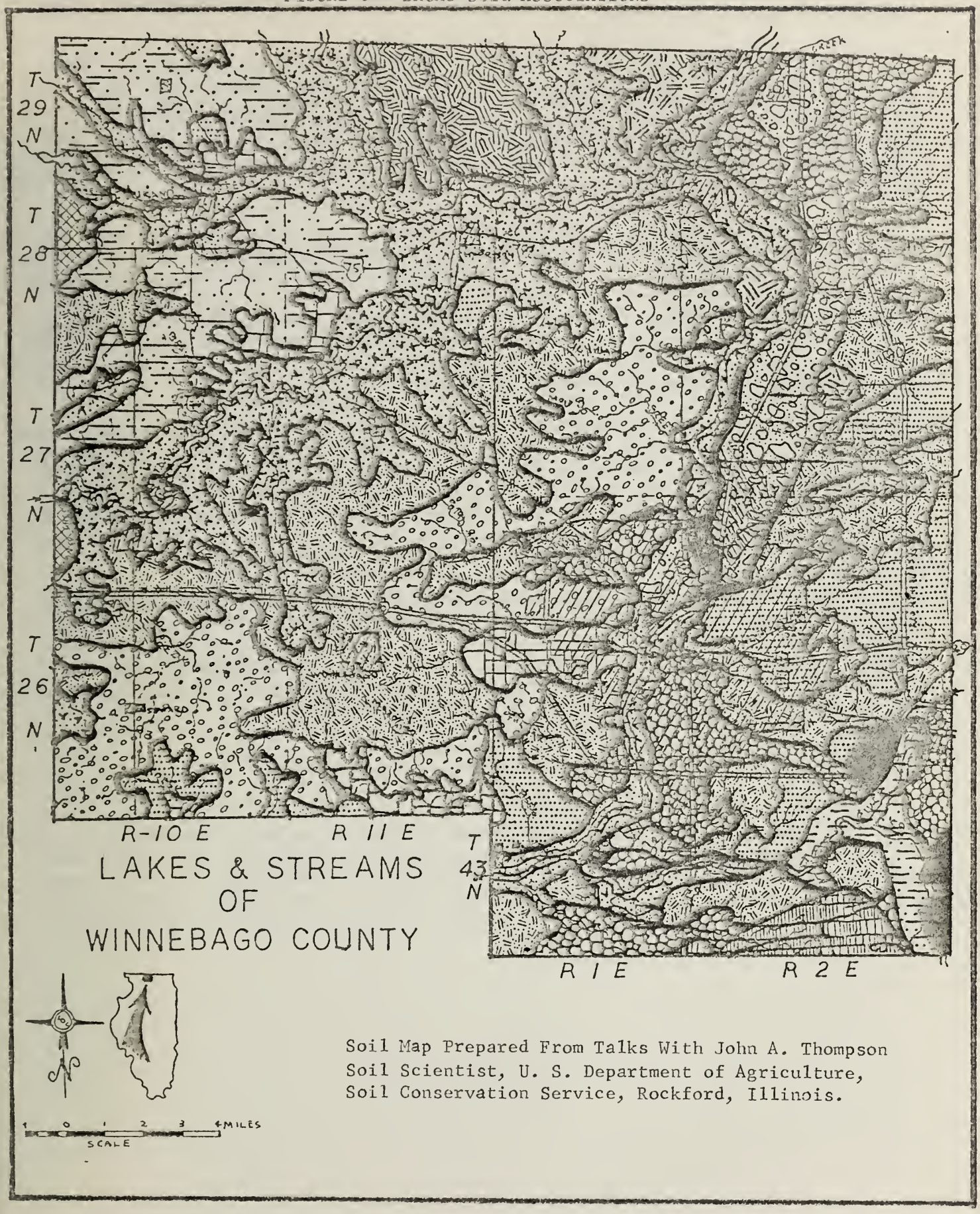
14. ST. CHARLES-ELBURN-SAWMILL - - - - - - - - - - 

FIGURE 6 - BROAD SOIL ASSOCIATIONS



Soil Map Prepared From Talks With John A. Thompson
Soil Scientist, U. S. Department of Agriculture,
Soil Conservation Service, Rockford, Illinois.

St. Charles Associations. The Flagg-Pecatonica-Westville Association is the most abundant of them and occurs for the most part, above the Rock River terrace along the eastern edge of the county.

The third general soil area consists of residual soils formed directly over limestone bedrock, including stoney loam and rock outcrop. These areas are covered by soils, which range from shallow to deep, are well drained, and have a moderately fine textured subsoil. The two associations which fall under this classification are the Woodbine-Dunbarton and the Hitt-Edmund. Of the two, the Woodbine-Dunbarton Association is most wide spread, covering most of the upland north of the Pecatonica River and west of the Sugar River.

The fourth general soil area includes primarily terrace soils, developed on benchlands, second bottoms (deposited by a glacial flooding), and as a result of the formation of Lake Pecatonica. These soils are well drained, have medium to coarse texture in both surface soil and subsoil and with little or no more clay in the subsoil than in the surface soil. This classification contains three associations: the Warsaw-Lorenzo, the Sparta-Dickenson-Lamont and the Lamont-Westville-Sogn. The most wide spread of the three is the Warsaw-Lorenz Association, which forms the Rock River terrace, north of the Kishwaukee River.

The fifth general soil area contains those soils developed along present flood plains, under late pleistocene swamps and other poorly drained areas. The two associations included under this classification are dominated by soils which are dark, deep, moderately permeable, and have medium or moderately fine textured subsoils. The Otter-Millington, and the St. Charles-Elkburn-Sawmill Associations comprise the group. Of the two, the latter is the most wide spread, forming the flood plain of the county's major streams. (Figure 6).

In the fall of 1969, the counties of Boone and Winnebago entered into a cost-sharing agreement with the U.S.D.A. Soil Conservation Service, which calls for a remapping and upgrading of their respective soil reports. This work is due for completing and publication in approximately six years. Those persons interested in specific soil information for a particular area are directed to the Soil Conservation Service Office at Central and Auburn Streets in Rockford.

ALPHABETICAL LISTING AND DESCRIPTION OF MAJOR LAKES AND STREAMS

Lakes

All bodies of water in the county were inventoried from aerial photos taken for the Agricultural Stabilization and Conservation Service in September, 1961. This work was completed in the winter of 1962, by Illinois Department of Conservation biologists as part of a state wide survey of water areas. In Illinois, the minimum size of a "lake" is considered to be 6.0 acres. The classification of impounded waters is as follows:

1. Federal: All impoundments owned, operated and maintained by an agency of the Federal Government.

2. State: All impoundments owned, operated and maintained by the Illinois Department of Conservation.

3. Public: Impoundments owned, operated or maintained by a governmental agency other than the Illinois Department of Conservation or Federal Government. This classification also includes all free public access impoundments such as city water supply reservoirs, recreation lakes and waters owned and operated by state agencies other than the Department of Conservation. U.S. Army Corps of Engineers owned waters turned over to the state for operation are classified as public.

4. Organizational: Impoundments owned, leased or maintained by a group of eight or more members, having permanent year-round residences located on lake sites and formally organized with election of officers, board of directors or appointed committee.

5. Private:

   A. Fee Fishing Waters: All impoundments privately owned or leased for which a fee is charged for fishing privileges.

   B. Private Waters: All impoundments privately owned or leased.

In this publication, no private water area of less than six acres will be described. All impoundments in this section are listed in alphabetical order by name. Following the name is the legal description, location, classification based on ownership, surface area in acres, maximum depth in feet, shoreline length in feet, and the year the water area was constructed.

Lakes

ATWOOD FISH FARM LAKES - T27N, R11E, S6; Organizational; Surface Acres - 15.0, 6.0, 5.0, 4.7. 0.4, 0.4, 0.2 and 0.5 (Total of 32.2 acres); Maximum depth - 7 to 15 feet; Shoreline Length - Total 5.7 miles; Shape- Mostly oblong; Constructed - 15 acre natural oxbow lake, rest of waters areas from 1940 to 1945.

These water areas are developed on a 330 acre tract located 12 miles northwest of Rockford, on Illinois Route 70. The fifteen acre oxbow lake has been developed into a company recreational area for Mr. Atwood's employees and their families, numbering about 2,000 persons. This area includes 3,300 feet of frontage in combination on the Pecatonica River and the oxbow lake. The oxbow lake is subject to periodic flooding and assuch contains most of the fish species found in the Pecatonica River, the most abundant of which are carp, bigmouth buffalo, both black and white crappies, smallmouth bass, bluegill, channel catfish and black bullheads.

The smaller lakes and ponds are managed to produce largemouth bass, crappie and bluegills, with the exception of the 0.4 acre trout pond at the spring source. These springs discharge 125 gallons per minute into the system. This water supply is further augmented by two 600 foot wells which tap the St. Peter sandstone aquifer and discharge a total of 150 gallons per minute into the pond system.

Two hundred fifty acres of this property have never seen a plow and are designated as a nature preserve by Mr. Atwood. The fish farm has much to offer in the way of natural flora and fauna, and should be included into the forest preserve system if the Atwood's ever decide to sell the property. At present, access is granted on a permission basis.

BROWNS QUARRY POND - T45N, R1E, S25SW¼; Organizational; Surface Acres - 4.0; Maximum Depth - 25 feet; Shoreline Length - 0.4 mile; Shape - Oval; Constructed - Begun in 1947.

This body of water is located about 1.5 miles north of Riverside Blvd. on the east side of Illinois Route 2. It is an active limestone quarry. Illinois Department of Conservation inspections date back to 1958, at which time its use was leased to the Greater Rockford Lung Divers Club. It was rehabilitated in June of 1964, because an over abundance of goldfish had made it too turbid for diving. In the rehabilitation, an estimated 1,000 pounds of fish were removed, most of which were green sunfish. The following fall, 350 fingerling largemouth bass were planted to control any survivor of the rehabilitation. It is known that survival did occur for goldfish. The water area is, at present, leased by a local Sportsmens' Club and is, therefore, not accessib to the general public.

FOUR LAKES FOREST PRESERVE PONDS - T27N, R11E, S9SW¼; Public; Surface Acres - 8.2, 3.7, 3.6, 2.7 (Total 18.2 acres); Maximum depth - 8.0 feet for large lake, for rest 5.5 feet; Shoreline Length - 1.1 miles; Shape - rectangular; Constructed - 1924.

These bodies of water were part of the Illinois state fish hatchery system from 1924 until November of 1959, when the property was traded to the Winnebago County Forest Preserve District, as part of the purchase price for a tract of land which now forms the main entrance of Rock Cut State Park. The Pecatonica Fish Hatchery was unable to live up to the full expectations of its intended use. It had a long history

of contamination with brook sticklebacks and sunfish, excessive aquatic vegetation, and in most years, low reproductive success for largemouth bass.

Since the Forest Preserve District took over this area in 1962, it has never produced desirable fishing. The original stocking in May, 1960, included 130 and 1,000 yearling largemouth bass and bluegill, respectively. These bass did not reproduce well in 1961, so that fall, 600 more yearling and 900 fingerling bass were added along with 650 channel catfish and 1,000 redear sunfish fingerlings. In 1962, it was decided that the bluegill had already become too abundant, and in August of that year, an estimated 6,000 of them were seined out and removed by area sportsmen. The county Herpetological Society seined 18 young-of-the-year northern pike from the Sugar River and stocked them in August of 1962, and the Forest Preserve District stocked a total of 90 northern pike between 1960 and 1963.

The Department of Conservation had no further contacts with the area until May of 1966. A population analysis made at that time disclosed an excessively abundant population of bluegill and other sunfish, no apparent reproductive success on the part of either largemouth bass or crappies since 1962, and an over abundance of aquatic vegetation. In the fall of that year, the four bodies of water were drawn down, the large game fish salvaged by electro-fishing, stocked into the large pond, and the three smaller ponds were completely rehabilitated. This operation removed an estimated 2,578 pounds of fish from the water area. The preserve was closed to fishing until July, 1967, to allow the remaining bass time to spawn. The 1967 bass hatch was quite successful and survival was also quite good. A sampling carried out in September of that year disclosed many large panfish.

The fish population has steadily improved up to the present. A remaining problem is the inability to keep the aquatic vegetation in check. The cause of this problem is two-fold. 1. The ponds have excessive littoral areas (especially the northeast and the southeast ponds) and 2. the county's lack of funds earmarked for managing the area.

BILL HOWARD LAKES - T27N, R10E, S1; Organizational; Surface Acres - 21.1; 5.0, 2.6, 2.5, 1.8, 1.4 Total - 344 acres; Maximum Depth - Varies from 8 to 15 feet for the various ponds; Shoreline Length - Approximate total of 4.3 miles; Shape - Mostly oblong; Constructed - 10 + 5 acre oxbows created in 1935, rest of ponds constructed since mid-1950's.

These bodies of water have been developed on an 818 acre tract owned by Mr. Howard, on Illinois Route 70, just west of the Atwood Fish Farm. This area is used by the employees of Rockford Blacktop Construction Company and friends of the owner. The 21.1 and 5.0 acre oxbow lakes were formed in 1935, when the Pecatonica River changed its course. These bodies of water contain most of the usual river species of fish. Sampling in 1963 showed carp, bigmouth buffalo and white crappie to be most abundant in the larger oxbow (which is still subject to flooding). The 5.0 acre oxbow was deepened, rehabilitated, and restocked with largemouth bass and bluegill in 1964. The 2.6 acre pond is managed for channel catfish and also contains largemouth bass, bluegill, and white crappies. The 1.4 acre pond is stocked with rainbow trout for put and take fishing. The 2.5 acre pond is included inside a fenced wildlife exhibit and preserve maintained by Mr. Howard. The area is accessible on a permission basis only.

HORSESHOE LAKE - T28N, R11E, S26NW¼; Private (Was a fee-fishing area in 1954); Surface acres - 10.0; Maximum depth - 4 feet; Shoreline length - 1.0 mile; Shape - oblong; Constructed - oxbow lake, date of origin unknown.

This body of water, owned by a Mr. Rex Light, is a natural oxbow lake located along the west bank of the Pecatonica River, just south of Harrison, Illinois. Department files show it to have been run as a fee-fishing area back in 1954. The lake was sounded that year and found to be quite shallow. It experienced a summer kill in 1953. The fish population was reported to be carp, buffalo, and yellow and black bullheads. Like most oxbows along the Pecatonica Valley, it is subject to periodic flooding. Its present accessibility is unknown but probably requires permission.

LAKE LEANNA - T45N, R1E, S13NE¼; Organizational; Surface Acres - 4.8; Maximum Depth - 9.0 feet; Shoreline Length - 0.4 mile; Shape - Round; Constructed - 1958.

This pond is located in the Leanna Lakes Subdivision on Old River Road just south of the entrance to Atwood Homestead Forest Preserve. The subdivision presently contains 43 homes. Information indicates that the water area was never stocked with fish, and those that occur are volunteers from Black's Creek upon which the pond has been developed. The Illinois Department Conservation has had no involvement with the water area. Access is restricted to the property owners in the subdivision.

LAKE MANOA - T44N, R1E, S5NE¼; Organizational; Surface Acres - 20.0; Maximum Depth - 10.0 feet; Shoreline Length - 0.75 mile; Shape - Rectangular; Constructed - Finished in 1958.

This lake was constructed on a branch of the North Fork of Kent Creek, known locally as Kilburn Creek. It has an 860 acre watershed, which drains partially through the Tullock's Woods Subdivision (this could be a source of enrichment via septic drainage, causing algal problems in the future). The lake was stocked with breeder largemouth bass in 1962 (numbers unknown) and with rainbow trout in 1963. The other species present are from the watershed, which wasn't rehabilitated prior to impoundment. A fish sampling undertaken in the fall of 1964 disclosed the presence of large numbers of fingerling largemouth bass, and an overly abundant population of bluegill. Various remedial measures were recommended in hopes of controlling the bluegill population. The association members have attempted trapping to a limited degree.

Due to a leakage which developed in the dam, the lake was lowered to half volume for two weeks in the fall of 1965, thereby causing a short term drawdown. A sampling carried out in mid May of 1966, showed some improvement in bluegill size, however, their physical condition was still quite poor. Yearling bass were quite abundant, although a partial rehabilitation was recommended for that fall. The association declined to follow the recommendation and instead chose to attempt a planting of fry northern pike in the spring of 1966, which did not survive well. Algae control was undertaken for the first time in the summer of 1966 and has been initiated every year since.

The lake was again sampled in the fall of 1968 and a marked improvement was noted. The bass from the 1965 hatch had grown to a size of 10.0 to 12.0 inches and had apparently affected the much needed control on the bluegill population. These bluegill were found to be of a catchable size (6.5 inches plus).

LAKE SUMMERSET - T28-29N, R9-10E, S1,6,7; Organizational; Surface Area - 285.0; Maximum Depth - 42.0 feet; Shoreline Length - 6.4 miles; Shape - Oblong; Constructed - 1969.

This lake and its adjoining subdivision is presently under development on the south branch of Otter Creek. The dam abutts Best Road and will back water in a northwestwardly direction into Section One of Rock Grove township in Stephenson County. Boise Cascade Properties Incorporated is developing a 2,000 lot subdivision around the lake. Small islands of park land and several lake access areas, beaches, recreational facilities are included in the plan, yet approximately 85 percent of the shoreline is to be subdivided. The area will have central sewage treatment with the plant to be located below the dam. A possible problem is siltation from the 4,500 acre watershed, which is in need of many soil holding improvements. At the very least, a silt retention reservoir should be built immediately upstream from the lake.

Construction on the dam wasn't finished early enough in 1969; therefore, the watershed stream and lake basin will be rehabilitated in the spring of 1970. Present plans call for the planting of fingerling largemouth bass and fry northern pike and walleye, if available, in the spring of 1970, and the addition of fingerling bluegill in the fall. Access to the lake will be restricted to property owners and their guests.

LAKE VICTORIA - T46N, R2E, S5SW¼; Public; Surface Acres - 16.5; Maximum Depth - 52.0 feet; Shoreline Length - 0.6 mile; Shape - Oval; Constructed - Gravel mining began in 1942.

This body of water is an active gravel pit, located on Dorr Road on the southeast edge of the city of South Beloit. In 1965, it was made part of the city park, which lies adjacent to the lake. A fishery survey taken in July of 1966, revealed the presence of an abundant population of both bluegill and yellow perch, with few predator fish in evidence. Due to the great depth of the pit, a total rehabilitation was not attempted because it would have not been economically feasible. Instead a partial rehabilitation was accomplished on September 6th, of that year. As a result of this operation, an estimated 800 pounds of fish were removed from the lake, 60 percent of which were bluegill and yellow perch. Two thousand fingerling largemouth bass were planted in the water area on September 26, 1966, to augment the supply of predator fish.

Sampling done in September of 1967, failed to turn up a single bluegill and only 10 perch were seen. Survival of the largemouth bass planting was good and growth was excellent. A negative result of the rehabilitation was an explosion of the white sucker population.

In the spring of 1968, fifty each of rainbow and brown trout were planted in the water area to test if they could survive the summer temperatures. Sampling that fall indicated that there was a strong bass population and that survival of the 1968 spawn was good. No suckers from the 1968 spawn were found, as bass predation must have all but eliminated it. Only one of the trout was collected.

The city obtained a planting of 5,000 channel catfish fingerlings in 1969, and it is hoped that they will do well as this species was fairly abundant prior to rehabilitation. The basic problem with the water area at present is the fact that it is relatively inaccessible except for a small area on the west shore and the banks are too steep.

LARSON BROTHERS SOUTH PIT - T44N, R2E, S5NW¼; Organizational; Surface Acres - 11.0; Maximum Depth - 20 feet; Shoreline Length - 7.0 miles; Shape - Oblong; Constructed - Gravel mining began in 1925.

This pit is located south of Windsor Road, just west of Alpine Boulevard. In 1952, a fisheries survey was undertaken to determine the feasibility of establishing this pit as a fee fishing area. At that time it was known to contain black and yellow bullheads and sunfish. It was recommended that the water area be rehabilitated. At some time since then, largemouth bass were introduced. Access to the area is now being granted on a permission basis.

LEVINGS PARK LAKE - T44N, R1E, S28NW¼; Public; Surface Acres - 23.5; Maximum Depth - 6.0 feet; Shoreline Length - 0.8 mile; Shape - Oblong; Constructed - 1935.

This lake is located on the south branch of Kent Creek in the Rockford Park District's Levings Park. The land for this park (123.0 acres) was donated to the district in 1920, by the then Rockford Township Highway Supervisor, Thomas Goodsman Levings. The lake was constructed from 1933 to 1935 using 175 W.P.A. workmen. During the construction period, 64,000 cubic yards of dirt were removed from the lake bed, two-thirds of which was by manual labor.

According to Illinois Conservation Department records, good fishing was short lived, lasting from 1936 to 1941. Since 1951, angler success has been poor. In 1949, the lake was seined for rough fish, and seven tons of carp were removed. The first Illinois Department Conservation inspection was in 1953. At that time, carp were reported to be the principal species taken by anglers. The lake's turbidity at that time was only 10 inches, which is insufficient visibility for game fish to feed properly.

There was no further involvement with the lake or its fishery with the exception of political stockings of mixed panfish on an almost yearly basis until recent years. In 1963, the County Council of Sportsman's Clubs requested that the Department examine the lake and make recommendations as to its management. These recommendations were that the lake be dredged so that a maximum depth of nine feet could be maintained in at the very least 25 percent of the lake, and secondly, that the present fish population be removed from the lake and the entire watershed and the lake restocked with desirable species. In 1967, the catch was so poor at the annual children's fishing derby that the event was moved to another location. All the yearly plantings of fish seem to have done little else than to worsen an already bad situation.

In 1969, park district officials contacted Illinois Department of Conservation personnel and indicated that they had finally decided to go ahead with our recommendations. After some study, it was decided that dredging would not be economically feasible at present, especially since they have no control over the lake's 5,000 acre watershed which has dumped six feet of silt deposits into the lake in the past 40 years. If all the details can be worked out, the lake will be rehabilitated in 1970. Without the necessary dredging, the success of this venture is questionable.

LILJA'S FEE FISHING PONDS - T28-29N, R10E, S31NE¼; Private-Fee; Surface Acres - 2.3 and 1.0; Maximum Depth - 7.0 and 10 feet; respectively; Shoreline Length - Total of 0.4 mile; Shape - Oval; Constructed - 1955 and 1963.

These ponds are located on the north fork of Otter Creek, on Best Road, four miles northwest of Davis, Illinois. There is a spring source on the north side of the larger pond, which adds water at a rate of 50 gallons per minute. The larger

pond was stocked with 200 each of largemouth bass and bluegill. The site is presently under consideration for impoundment development by Boise-Cascade Properties Incorporated. At present, access is granted by payment of a fee.

MARTIN PARK LAGOON - T44N, R1E, S1SW¼; Public; Surface Acres - 1.7; Maximum Depth - excavated to 9 feet; Shoreline Length - 0.3 mile; Shape - Oval; Constructed - 1954.

This water area is located in the 12.2 acre, Charles Woodward Martin Park, on the east side of the Rock River at Riverside Boulevard in Loves Park, Illinois. The park, launching ramp, and lagoon were developed jointly by the Illinois Department of Conservation and the Rockford Park District as a pleasure boating access and picnic area. The lagoon is directly connected to the Rock River, and consequently is relatively unmanageable for fishery purposes. From 1955 up to the late sixties, the area had received yearly plantings of mixed fish from the Illinois Department of Conservation. These plantings have had no lasting effect on the area's fishery, which is directly dependent upon conditions in the river. Early ice fishing for crappies is good most winters, while in the spring, there are occasional catches of northern pike, walleye and smallmouth bass. Summer fish is primarily for bullheads, channel catfish, carp and buffalo. Since the area is owned by the Park District, it is freely accessible to the public.

PEARL LAKE - T46N, R2E, S8NE¼; Private - Fee; Surface Acres = 30.6; Maximum Depth - 85.0 feet; Shoreline Length - 1.2 miles; Shape - Rectangular; Constructed - Gravel Pit mining began in 1920's.

This area receives a wide variety of uses, including camping, skin diving, ice skating, snowmobiling, fishing, aesthetics and swimming. The owner operates a fee swimming area and restaurant on the grounds.

The fish population has never been sampled; however, the primary species' composition alledgedly is large and contains smallmouth bass, largemouth bass, rock bass, crappies, perch, walleye, northern pike and rainbow trout. Fishing is reported to be good for largemouth bass and panfish, with a few pike and walleye taken in spring. Access is granted on an irregular basis by permission or a trespass fee depending on the owner's desire.

PIERCE STATE LAKE - T45N, R2E, S26,27; State; Surface Acres - 162.2; Maximum Depth - 36 feet; Shoreline Length - 4.9 miles; Shape - Oblong; Constructed - 1960.

This impoundment was originally conceived in the mid 1940's. The construction of the Northwest tollway in the 1950's effectively cut off the basin and eliminated 40 acres from the proposed lake site. Construction was begun in 1959; the 46 foot high dam was finished in the fall of 1960; and the valve closed on May 15, 1961.

Previous to the final closure on March 30, the lake basin, watershed, stream and ponds were rehabilitated. This operation removed an estimated total of 2,000 pounds of fish, most of which were white suckers and various minnow species, especially the stoneroller.

On April 12, 1961, 40,000 fry northern pike and on May 13, 60,000 fry walleye were planted in the lake. These walleye fared quite well, yet, the northern pike had little survival and have never contributed much to the fishery. A total of 127 brood and 5,000 advanced fry largemouth bass were stocked into the impoundment from May to July of 1961. To these early plantings were added 242 walleye fingerlings raised on the property; 21 breeder brown bullheads; and 45 breeder and 17,000 fingerling bluegill.

Sampling in the fall of 1961 showed the breeder bass had gotten off a large spawn and survival was good; green sunfish, white suckers and black bullheads had survived the rehabilitation, had spawned and survival was high for all three species. The lake had reached spillway level by November 17, 1961.

By June of 1962, the 1961 bullhead young averaged 8.3 inches, the largemouth bass 6.5 inches, and walleye 7.8 inches. The walleye were readily caught and many were taken that year. Fair numbers of bass and walleye were known to have escaped over the spillway. Sampling that fall showed the 128 walleye collected to be an average size of 9.0 inches. Survival of the 1962 hatch was poor for almost all species probably due to the large numbers of predator fish in the lake. In the fall of 1962, the lake was drawn down seven feet to facilitate construction of a bridge over the spillway.

By the spring of 1963, the original bullheads were averaging three quarters of a pound and fishermen were catching them in large numbers. Walleye and bass were also being readily caught. Sampling that fall showed that the bass and walleye continued to do well and that both species were abundant, and the bluegill had had good reproductive survival.

Die offs occurred in both the bluegill and the bullhead population in the following years: 1963, 1964, 1965, 1968 and 1969. Aquatic vegetation control was undertaken first in 1964 and has been a yearly undertaking ever since. Fishermen creel surveys were run during the summers of 1964 and 1965, and a limited ice fishing creel was undertaken during the winter of 1966-1967.

The bass population has held up well and has shown good annual recruitment every year. The walleyes have shown limited reproduction since 1965, although, survival has been uniformly poor. This species is beginning to disappear from the fishery as attempts to rear fingerlings in an adjacent borrow pit have produced meager results. The black bullheads have had little reproductive success since 1963 and are at present in low numbers, while the same is also true of the green sunfish. White suckers are still moderately abundant and many of them are quite large. The first northern pike was collected in the spring of 1969. In the fall of 1966, three black crappies were collected. This species is as of 1970, beginning to approach over abundance in relation to available food and will most likely cause problems in future years. Although fishing pressure is quite high (600 - 800 hours of effort per acre of water) Pierce Lake has not produced what could be considered large sized bluegills since 1964. In September of 1967, a partial rehabilitation for bluegill control was carried out removing an estimated 2,000 pounds of these fish. A similar partial was carried out in October of 1969; however, poor success was achieved due to unseasonably cold weather. A 12 foot drawdown is scheduled for September, 1970, in hopes of finally increasing the average size of the lake's bluegill.

Ice fishing derbies have been held in January since 1966, and angler use of the lake in winter has increased steadily since then. The lake also is used by skaters, tobogganers and snowmobilers all winter long. There are even a few hardy campers who venture forth in winter. Winter facilities are limited at the lake.

Some pollution problems have occurred in the watershed and have with the exception of cattle pasturing been corrected. Siltation, which at the time of construction was projected to cause a 25 percent loss in volume in 50 years, has occurred and the shallow eastern end of the lake where approximately two feet of silting has occurred since 1963. As the lake has aged and become enriched, plankton algae blooms have become more intense.

ROCK CUT EAST PIT - T45N, R2E, S26NE¼; State; Surface Acre - 0.5; Maximum Depth - 12 feet; Shoreline Length - 0.1 mile; Shape - Oblong; Constructed = 1957- 1958.

This "borrow pit" pond which lies adjacent to Willow Creek, up stream from Pierce Lake, and next to the tollway, was excavated as a source of fill during the construction of the Northwest tollway during the 1950's. It has been used as a rearing pond for the production of walleye fingerling since its purchase as a part of Rock Cut State Park in 1960. Due to the pond's infertility and other complications, the production has been quite poor. The walleye rearing efforts were suspended in 1968 and smallmouth bass substituted in their place in 1969. It is equipped with a six inch drain pipe which allows for a four foot reduction in water level. The pond is fed by a spring located on the north bank, which keeps the drain pipe flowing over half volume. Since this is a rearing pond, fishing is not allowed.

ROCK CUT WEST PIT - T45N, R2E, S26NE¼; State; Surface Acres - 1.2; Maximum Depth = 9.0 feet; Shoreline Length - 0.2 mile; Shape - Oblong; Constructed - 1957 - 1958.

This "borrow pit" pond lies approximately 1,000 feet due west of the east pit. An attempt was made to use this pond for rearing northern pike but since it is not drainable and due to the fact that the basin is full of logs and other debris, retrieval of the fish was difficult, and the project was dropped. The northern pike have survived in the pond and limited reproduction has occurred. Largemouth bass, bluegill and black bullheads are known to now be present in the pond. In recent years, this water area has become the dumping grounds for unwanted autos and other items, despoiling its aesthetic beauty.

ROCK VALLEY JR. COLLEGE CAMPUS POND - T44N, R2E, S10NE¼; Public; Surface Acres - 1.8; Maximum Depth = 8.0 feet; Shoreline Length - 0.2 mile; Shape - Rectangular; Constructed - 1947.

This pond was constructed in 1947, by Dr. Maurice Rogers, under the consultation of one of the Illinois Department of Conservation game biologists. Problems arose due to a lack of adequate depth (maximum at that time was 5.5 feet), muskrat burrows and leakage through permeable gravel in the pond levy. The original stocking was made by the U.S. Fish and Wildlife Service. These fish were lost completely through a winter fish mortality in 1951. The pond was restocked by our Department in the fall of 1952, and was enlarged to its present size and deepened in 1955. The pond is presently kept full during droughty periods by a well located on its east shore.

The Roger's Farm was purchased in 1965 by the newly created Rock Valley Junior College District as a location for its permanent campus.

College officials contacted the Illinois Department of Conservation in May of 1966, concerning the management of the water area. A population analysis showed the pond to contain an over abundance of bluegills and green sunfish. A complete rehabilitation was recommended, and completed on August 31, 1966, removing an estimated 280 pounds of fish, mostly bluegills. Two hundred each of largemouth bass and bluegill fingerlings were planted in September of that year. Presently, the population is in good condition.

SPRING LAKE ESTATES LAKE - T44N, R2E, S9; Organizational; Surface Acres - 12.0; Maximum Depth - 9.0 feet; Shoreline Length - 1.0 mile; Shape - Oblong; Constructed - 1965.

Illinois Department Conservation was contacted in August, 1965, by Mr. W. W. Lobdell, regarding the stocking of this lake. Since the basin had communicated with Spring Creek during its construction, it was decided to rehabilitate the water area prior to stocking. The lake was rehabilitated on September 13, 1965, removing an estimated 900 pounds of fish, most of which were chubs. Seventy carp were also eliminated, making the project well worthwhile. It received a planting of 1,200 each of largemouth bass and bluegill fingerlings in early October of that year. By May of 1967, these fish were averaging 8.3 inches and 6.5 inches respectively. In August of 1968, the original bass averaged 10.5 inches and the bluegill 8.5 inches. Both species reproduced very well that year. The 1969 sampling disclosed a strong bass population with the original fish now averaging 12.5 inches with many one and two year old fish in it. The bluegill population was in good condition with many catchable size fish in the sample. Access is restricted to people living in the subdivision and their friends.

SINNISSIPPI PARK LAGOON - T44N, R1E, S13, SE¼; Public; Surface Acre - 0.1; Maximum Depth - 5 feet; Shoreline Length - 0.1 mile; Shape - Oblong; Constructed - early 1920's.

This body of water is located in the Rockford Park District's 123 acre Sinnissippi Park, river front section, between U.S. Route 51 and the Rock River. Its primary use is as a reflecting lagoon for the floral gardens, however, in winter children use it for ice skating. There is a resident duck population in summer and the fertility from their fecal enrichment produces a dense plankton a algae bloom. The pond contains black bullheads and goldfish. Fishing is not allowed.

GLENN SWARTZ LAKE - T29N, R11E, S32NE¼; Private; Surface Acres = 17.0; Maximum Depth - 7.0 feet; Shoreline Length - 0.75 mile; Shape - Oblong; Constructed - Unknown, Natural Oxbow Lake.

This body of water is located on a 30 acre parcel lying just west of the Sugar River on Yale Bridge Road. A population sample undertaken in 1968, disclosed a wide variety of species, including largemouth bass, northern and grass pike, crappies, warmouth bass, bluegill, bullheads, suckers, buffalo, carp and channel catfish. The most abundant fish were the carp, buffalo and bullheads. Beaver had dammed the outlet stream and caused a three foot rise in the water level in 1968. Due to its extreme shallowness, direct communication with the Sugar River during flooding and its excessive watershed, the area is presently unmanageable for fish production and would be best left as a nature preserve. Fishing is

reported to be good for bass, bluegill and crappies. Access is granted on a permission basis only.

TALL OAKS SUBDIVISION LAKE - T44N, R1E, S16; Organizational; Surface Acres - 2.1; Maximum Depth - 12 feet; Shoreline - 0.3 mile; Shape - Oblong; Constructed - 1962.

This body of water is located in the Tall Oaks Estates Subdivision, 2½ miles west of Rockton on Rockton Road and adjacent to Raccoon Creek. It is primarily a dugout pond with the west bank forming a berm which isolates it from the creek. It has a hard gravely bottom and very little littoral area. A population sample taken in 1969 showed it to contain primarily black bullheads, green sunfish and channel catfish. Other species present are northern pike, small and rock bass and black crappies. Presently, the bullhead and green sunfish are overly abundant and stunted. A total rehabilitation was recommended but this has not as yet been accomplished. Access is restricted to owners whose property abutts the pond.

TUTTLE SLOUGH - T27N, R10E, S10,11; Public; Surface Acres - 4.3; Maximum Depth - 5 feet; Shoreline Length - 0.6 mile; Shape - Oblong; Construction - Natural Oxbow lake.

This body of water is located in the recently acquired Pecatonica River Forest Preserve, on Brick School Road, 2.5 miles northeast of Pecatonica. The oxbow is presently unmanageable for a sustained yield fishing due to its extreme shallowness. If the area is to be used for fishing, the lake must be dredged to a maximum depth of 10 to 12 feet, in at least 25 percent of the surface area and a sufficiently high berm placed around it to insure its protection from communication with the Pecatonica River during periods of flooding.

WHELAN'S QUARRY POND - T26N, R11E, S15SE¼; Organizational; Surface Acres - 2.6; Maximum Depth - 11.0 feet; Shoreline Length - 0.2 mile; Shape - Rectangular; Constructed - First filling 1947.

This body of water is an abandoned limestone quarry which is located four miles southwest of Rockford on Kelly Road. The quarry was originally stocked in the spring of 1948 with largemouth bass, bluegill and rainbow trout. In August, of that year the pond experienced what is known as a "summer kill" due to high temperatures and low oxygen resulting in the loss of 35 trout.

By 1954, the fish population was out of balance and curlyleaf pondweed was abundant. In May of 1955, the pond was partially rehabilitated, removing an estimated 10,000 tiny bluegill and over 1,000 green sunfish. In September of that year, the fish population was resampled and it was found that the bass had gotten off a good spawn. The bluegill still remained small but were fatter. In the winter of 1956-1957 and 1958, bluegills were still found to be small (averaging 6.5 inches) but were growing at an average rate. Another visit was made in 1961 to recommend aquatic vegetation control.

Whelan's pond was again sampled in October of 1967, and a depth contour map made. Bluegill were again found to be small (largest - 6.0 inches) and crappies and white suckers were also present. A total rehabilitation was recommended

followed by restocking with smallmouth and rock bass. The recommendations were never carried out; there has been no further contact with the area. Two changes have occurred since 1954, the pond has silted in one foot, and it is now quite fertile. A dense bloom of plankton algae was found in 1967. Access is by club membership only.

WINDSOR LAKE - T45N, R2E, S32SW¼; Organizational; Surface Acres - 38.5; Maximum Depth - 15.0 feet; Shoreline Length - 1.6 miles; Shape - Oblong; Constructed - Gravel mining began in 1950.

Windsor Lake is located at the junction of Alpine and Windsor Roads on the northeast edge of the city of Loves Park. Fisheries personnel first came in contact with the area in 1954, at which time the owner desired recommendations for stocking it with fish. The water then consisted of two pits, a four acre parcel which is the present swimming beach and an eight acre pit abutting Windsor Road. Since the owner was going to charge a trespass fee, Illinois Department of Conservation declined to stock the water area. In 1956, another inspection was made and as the 15 acre pit was overrun with panfish and minnows, total rehabilitation was recommended. The swimming beach was at that time already in use and a fifty cent trespass fee enforced. The rehabilitation was never carried out.

We had no further involvement with the area until the winter of 1964, when the author was contacted by the leasee, who said that the preceding summer the feet of many swimmers had become impaled on the spines of small bullheads, and that some had to be hospitalized due to severe swelling. He further stated that it was his desire to eliminate the fish population. This was accomplished on May 18, of that year, removing an estimated 5,000 pounds of fish, most of which were black bullheads and pumpkinseed sunfish. On may 25, 1964, the aquatic vegetation was controlled in the area used for swimming. In late June of 1964, the owner again contacted Illinois Department of Conservation. This time his problem was a severe infestation of shistosome flatworms, a parasite of waterfowl. This condition is commonly known as "swimmers itch" since the larval form in seeking its host will burrow under a bather's skin, causing a chigger like welt to appear. Treatment with a combination of copper sulfate and carbonate was recommended and once applied cleared up the problem.

In 1967, the pit was enlarged to its present size and fish were allowed to reenter the area.

STREAMS

Each stream included in this survey is first described by name and the legal location of its point of exit from the county or its mouth. Information is also given concerning its tributary relationship, the approximate surface acres, total length in county, gradient, the fishery involved, approximate drainage area, available access points, information concerning pollution and finally fishermen usage.

BEAVER RUN - T27N, R10E, S10SE¼; Surface Acre - 0.6; Miles - 3.5; Average Width - 2 feet; Gradient - 37.0 feet/mile; Tributary - Pecatonica River.

This moderately steep gradient stream is located on the newly acquired Pecatonica Forest Preserve property. The depth of flow varies from four feet at the mouth, to an intermittent flow in the upper reaches. The watershed includes a total of 1,196.4 acres, the land use of which is a mixture of permanent pasture, row crops and bottomland timber.

Long range plans call for the construction of a small reservoir on this drainage; however, a series of test borings will have to be under taken to make sure water can be held.

The fish composition is primarily forage minnows and suckers. There is no history of pollution in the watershed and angler usage would be nonexistent due to the stream's small size.

BLACK'S CREEK - T45N, R1#, S13NE¼; Surface Acre - 0.7; Miles - 5.1; Average Width - 8 feet; Gradient - 50 feet/mile; Tributary to Rock River.

Black's Creek has a very steep gradient and due to an excessive amount of field crops in the watershed, carries a large silt load and is therefore quite murky. With the exception of the area near its mouth, very little timberland occurs in the 5,248 acre watershed. Only the first 0.7 mile of the stream has a permanent flow. The rest is of an intermittent nature. The only impoundment in the watershed at present is Lake Leanna which was created by damming a north branch of the stream.

There is no record of pollution in the watershed but growth of the Lake Leanna Subdivision could possibly cause problems. Angler usage of the stream is minimal occurring primarily in the vicinity of the River Road Bridge. Seine hauls taken in 1968, collected 10 species of forage minnows, the most abundant of which were bluntnose minnows and redfin shiners. Due to the rapid runoff characteristic to the watershed, soil holding practices such as grass waterways and contour plowing are a must to control erosion.

CANAL CREEK - T43N, R1E, S30NE½; Surface Acres - 6.3; Miles - 3.5; Average Width - 15 feet; Gradient - 8.5 feet/mile; Tributary - Rock River.

The low gradient stream begins in Ogle County where much of it is of an intermittent nature. The stream bottom is primarily composed of silt and gravel. The 3,072 acre watershed has a land-use pattern where permanent pasture predominates, although the one-half mile proximal to the mouth has a heavy timber cover. Upstream from Kishwaukee Road the stream has been extensively dredged and straightened. The creek is impounded by a two foot high rock dam about 300 feet west of Kishwaukee Road. There are no other impoundments in the watershed.

In the fall of 1968, several seine hauls collected a total of 18 species of fish most of which were forage minnows; the most abundant of which were the bluntnose minnow and johnny darter. Also collected were bluegill and green sunfish. This stream is most likely used by fish from the Rock River as a spawning area. There are no indications or records of pollution with the exception that some erosion occurs in the area where the stream channel was straightened. Angler usage is minimal.

COOLIDGE CREEK - T27N, R10E, S12NE¼; Surface Acres - 5.3; Miles - 9.5; Average Width - 8 feet; Gradient - 18.9 feet/mile; Tributary to - Pecatonica River.

This stream's 10,880 acre watershed begins just west of the village of Winnebago in the southwest corner of the county. From its origin, it flows snake-like in a due north direction to its confluence with the Pecatonica River four miles northwest of Pecatonica, Illinois. The upper watershed is somewhat intermittent with only the lower 5.5 miles maintaining a permanent flow.

The stream has a maximum width of 20 feet; a minimum width of four feet, and tends to average eight feet wide. Three feet is the maximum depth and 18 inches, the average. Its bottom is predominately fine sand mixed with some silt and gravel. Land use in the watershed is predominately agricultural and pasture is the main cover type, with some cropland and almost no timber. There is evidence of many springs and watercress abounds. Due to meandering and the fineness of the till there is much undercutting and accompanying slumping of stream banks. Only three impoundments are known to occur in the watershed at present, totaling 5.5 acres. The watershed seems to be one of the better areas in the county for small impoundment development.

Dawes (and Terstriep 1967) indicates the possibility of locating a sizeable reservoir (262 acres) on this stream. The dam location would be one-quarter of a mile south of Smith Road, would lie in a northwesterly direction and be 1,300 feet long. At a proposed elevation of 800 feet m.s.l. the lake's maximum depth would be 25 feet and would back water south to U.S. Route 20. Subject to confirmation by an adequate program of test boring, this site is said to be fairly good.

Angling and pollution are presently negligible due to the streams small size and rural land use pattern. Seine hauls made in 1968 revealed the presence of seven species of fish, the most abundant of which were the common and bigmouth shiners and the creek chub.

DRY CREEK - T46N, R23, S30SE¼; Surface Acres - 8.3; Miles - 11.3 (counting both forks); Average Width - 6 feet; Gradient - 27.1 feet/mile; Tributary to - Rock River.

This moderately steep gradient stream begins on the upland of the Rock Valley slope in Boone County, Illinois and Rock County, Wisconsin. It enters Winnebago County in the extreme northeastern corner and flows in a general southwesterly direction to its confluence with the Rock River in Hononegah Forest Preserve, one mile east of Rockton.

The north fork is 4.0 miles long, the south fork 5.0 miles and the main stream is 2.3 miles in length. Gravel and sand are the prominent bottom types with some silt and rubble also occurring. This stream flows in a three to five foot notch through the valley and has undercut its banks in many locations. The depth varies from zero in some to four feet in other areas with 18 inches being its average depth. There are presently no known impoundments in the 8,550 acre watershed with the exception of three small gravel pits totaling 1.1 surface acres.

The predominant soil types along the water course are brown sandy loam on gravel, brown silt loam over gravel, and along the Rock River flood plain mixed loam bottom. The brown sandy loam has a very course subsoil and rapid subsurface drainage which causes the stream to sink underground in the area of the main stem. In 1964, this caused a small fish mortality. A survey in 1965, showed the stream to be nothing more than isolated pools in July.

A total of 13 species of fish are known to occur in the basin. The most abundant of these are the bluntnose minnow, common and bigmouth shiner and smallmouth bass. This stream is an apparent nursery area for Rock River smallmouth, as in the 1965 survey quantities of fingerling smallmouth were taken. Angler utilization is almost negligible due to the streams' small size. Much of the watershed is in permanent pasture and row crops with small wood lots intersperced throughout. No pollutional source is known from the watershed; however, soap suds have been seen on the surface in the vicinity of Manchester Road.

FULLER'S CREEK - T43N, R1E, S15NE¼; Surface Acres - 1.3; Miles - 4.5; Average Width - 2.5; Gradient - 24.4 feet per mile; Tributary to - Rock River.

Fuller's Creek arises near the junction of Montague and Kelly Roads and flows in a general southeasterly direction to its confluence with the Rock River directly across from Blackhawk Island. Only the first mile on one-half is permanent with the upstream portion experiencing intermittent flow. The maximum depth is 2.5 feet; however, the stream would average only one foot deep. The bottom is comprised mainly of sand and gravel. Its 3,040 acre watershed is rapidly becoming urbanized. There are no impoundments located in this watershed and in dry years, the whole stream tends to dry up.

Seine hauls made in 1968, failed to collect a single fish. No pollution, with the possible exception of septiceseepage, is known to occur in the drainage. There is no angler usage due to intermittency and small size.

GROVE CREEK - T27N, R10E, S31SW¼; Surface Acres - 19.1; Miles - 8.3; Average Width - 18 feet; Gradient - 15.1 feet/mile; Tributary to - Sumner Creek.

This moderately low gradient stream arises in the gently rolling to flat topography on the south slope of the Pecatonica Terrace near the junction of Cunningham and Hoisington roads. From this point, the stream flows in a general northwesterly direction to its confluence with Sumner Creek just west of the Stephenson County line. Only the lower five miles of the stream is permanent, with the rest of the 8,512 acre watershed receiving an intermittent flow. The maximum depth incurred was five feet and the average depth is two feet. Many springs occur in the vicinity of the county's 146 acre Seward Bluffs Forest Preserve through which the stream flows for almost one mile. Watercress is common in the watershed. The land use of the basin is predominately permanent pasture followed by row crops and wood lots. The stream has cut through the limestone strata about 70 feet in the Seward's Bluffs area.

Although only one presently occurs, this watershed seems to be highly conducive to small impoundment development. The Forest Preserve District is presently considering the feasibility of constructing a 45 to 70 acre impoundment on the stream. Studies are underway to determine the possibility of solution channels occurring in the area of limestone outcrop. Prior to construction, attention needs to be paid to controlling soil erosion which is moderately heavy upstream from the park following rains. There are no known pollution at sources in this drainage at present.

In 1968, three seine hauls made in the vicinity of the forest preserve revealed the presence of 12 species of forage fish, the most abundant of which were common shiners, horneyhead chubs and stonerollers. Of note is the occurrence of the Ozark minnow in the stream. This species is very rare in this part of the state. Angler usage is negligible as the stream is too small to sustain game fish of interest to fishermen.

LOVES PARK DRAINAGE - T44N, R1E, S12SE¼; Surface Acres - 2.5; Miles - 5.0; Average Width - 4.0 feet; Gradient - 41 feet/mile; Tributary to - Rock River.

This rather steep gradient stream originates near the junction of Nimta and McFarland Roads on the Rock River Terrace. From its origin it flows in a general southwesterly direction through the city of Loves Park terminating in a 10 acre slough located in the Rockford Park District's 39 acre Shorewood Park. There is very little flow in the stream unless it rains. The maximum depth is four feet and 18 inches the average.

For years this watershed has been a problem to area residents due to surface flooding in residential areas. Few storm sewers are in existence in the affected area and road paving along with home construction have combined to drastically alter natural drainage patterns. There are six gravel pits and an 0.8 acre pond in the 4,672 acre watershed. Among the pits is Windsor Lake which is 38.5 acres.

Mixed loam bottom and black mixed loam are found along the stream which has cut a four to eight foot trench through them and exposed a stream bottom of pure sand and gravel.

Seine hauls made in 1968, failed to collect a single fish. The slough located at the mouth is known to be used as a spawning grounds for Rock River fish especially carp. Bow and arrow angling for this species is common in the estuarine slough but will probably be curtailed once park development occurs.

Since the stream flows through a heavily urbanized and industrialized area, pollutional sources are many. In certain locations, trash dumping along the streams' banks has spoiled the aesthetic quality of the area. There are no known fish mortalities attributed to this stream; however, oil and other substances have been found to be emitting from the existing storm sewers on occasion.

KEITH'S CREEK - T44N, R1E, S26SW¼; Surface Acres - 1.5; Miles - 8.9 (in county); Average Width - 1.5 feet; Gradient - 20.2 feet/mile; Tributary to - Rock River.

This stream arises on the east slope of the Rock River Terrace in Boone County. Its 7,040 acre watershed (Winnebago County Portion) enters Winnebago County near the junction of Collins and Paulson Roads. Keith's Creek flows in a general southwesterly direction passing through the 88 acre, Ruben Aldeen Park near Alpine Road. Just south of U.S. Route 20, it picks up the drainage of a small branch known locally as O'Roorgruis Creek which flows through the 68 acre Alpine Park where it is for the most part intermittent.

In 1943, a large flood control dam was built on this creek in Aldeen Park following an 11.1 inch downpour in July 8, 1942. This dam's valve was never closed since the reservoir plan called for it to be dry. A 100 plus acre lake could be created by closing the valve. The predominate bottom type is silt with some rubble and sand. The maximum depth is 2.0 feet and the average six inches. Much of the lower watershed has been developed to urban estates. The upper watershed has a land

use of mixed row crops and pasture. Quite a few acres of timber occur in the basin, along with four ponds, totaling 4.5 acres. The stream maintains a permanent flow on all but the driest of years.

Stream sampling carried out by the Division of Fisheries in 1965 revealed the presence of white suckers along with six species of forage minnows, the most abundant of which were creek chubs and the red-bellied dace. Due to the small size and lack of game fish there is no angling pressure. Pollution has never been a problem. Trash dumping along the stream is common in the city of Rockford.

NORTH FORK OF KENT CREEK - T44N, R1E, S26NW¼; Surface Acres - 8.3; Miles - 10.7; Average Width - 13 feet; Gradient - 15.8 feet/mile; Tributary - to Rock River.

Included in this fork is the one half mile long main stem. The western boundary of this watershed is delineated by Winnebago and Telegraph Roads on the north by a line almost due east of Wempleton and on the south by a line almost due east from the north edge of the Village of Winnebago. The stream flows in a northeast direction until it reaches the vicinity of Rockford Park District's Anna Page and Quarry Hill Parks (Total - 433 acres). From this point, the stream makes an abrupt turn to the southeast and empties into the Rock River just north of the Morgan Street Bridge. The North Fork receives the water of the South Fork, one block west of South Main Street in Tinker Park. The main stem is impounded by a shallow dam just east of Tinker Park creating a pool from which the Illinois Central Railroad used to draw water.

The predominant bottom type is gravel and large rubble. In some areas, the stream has cut to the Ordivincian bedrock. Water depths vary considerably with pools up to six feet in depth occurring in the Page Park portion. The average depth throughout is three feet. There is much riffle development along the course of this stream and in these areas, water depths seldom exceed six inches. In the early 1960's, area sportsmen with the aid of the park district constructed a series of 10 rock dams along the creek's course through Page Park to create an artificial trout habitat.

The upper portion of the 20,800 acre watershed has an agricultural land use pattern in which pasture and cropland have almost equal distribution. There is a belt of bottomland hardwood timber bordering most of the lower watershed. A considerable number of springs occur along with the accompanying aquatic vegetation, watercress. Seven ponds, totaling 4.0 acres and one lake are known to occur in the basin. Lake Manoa, a 20 acre impoundment is located just north of Route 70, on a side branch known locally as Kilburn Creek.

The Rockford Park District, in conjunction with the Army Corp of Engineers, are presently studying the feasibility of impounding the creek on the west edge of Page Park for flood control purposes.

The proposed reservoir could possibly be 185 acres in size with the spillway built at a level of 778 feet M.S.L., it would back water beyond Meridian Road and would have an approximate depth of 20 feet. Feasibility studies are not completed at this time; therefore, it is not known whether water can be retained or not. If constructed, this would be a most welcome addition to the county's recreational system. One small problem is the location of a producer of exotic chemicals in the watershed of the proposed impoundment. If provisions were made to allow for the tapping of water below the thermocline, the trout holding capacities below the dam would be greatly enhanced. Presently, the fish population is composed of forage minnows and suckers. In seven seine hauls taken in 1968, a total of 10 species of fish were recorded. In the section of the stream near its mouth, carp,

redhorse, white suckers, green sunfish and smallmouth bass are co-inhabitants with the minnows.

For many years the Department of Conservation has planted an average of 2,000 each of rainbow and brown trout in the Page Park area. Fishing is usually opened two weeks after planting in early April, and lasts about one and half months, by which time most of the trout have beeen caught. Some carry over of trout is known to occur as fishermen occasionally catch brown trout weighing from three to eight pounds.

Several pollution fish kills have occurred in the past 12 years and also releases of dyes which have discolored the water and killed some fish. These fish mortalities have been restricted to the area below Owen Center Road.

The stream banks and bottom from this road downstream to the mouth are aesthetically unappealing, being littered with every type of debris conjurable. An attempt was made in the mid-60's to initiate a clean up of the stream banks. This effort was restricted to a small area and was terminated after two days' work. Many industrial firms border the stream and periodically place stress on the aquatic organisms due to the variability of their effluents.

At present, public agencies own approximately two miles of the stream and angler usage is quite heavy in these areas.

SOUTH FORK OF KENT CREEK - T44N, R1E, S27NE¼; Surface Acres - 7.2; Miles - 7.2; Average Width - 8 feet; Gradient - 18.6 feet/mile; Tributary to North Fork of Kent Creek.

This stream has its origin on the southwest slope of the Rock Valley Terrace in the vicinity of Westfield Road. The watershed is bordered by Kelly Road on the south and U.S. Route 20, on the north. From its origin on the east side of the Village of Winnebago, the stream flows due east to its confluence with the North Branch 0.5 mile from the Rock River in Tinker Park. The stream is dammed at approximately Pierpont Avenue, creating Levings Lake, a 20 acre impoundment owned by the Rockford Park District. The stream is also dammed about 200 yards upstream from its confluence with the North Fork. This low level dam was put in primarily to provide water for industry.

The predominant bottom type for the stream would be sand and gravel with some rubble; however, these materials lie buried beneath a two to three foot thick layer of silt.

Many springs occur in the watershed, attested to by the presence of watercress. The stream level varies drastically following rainfall and carries quite a heavy silt load. This silt has been deposited since 1936 in Levings Lake causing it to lose over half its volume. The maximum depth of the stream is six feet with an average depth of three.

There are presently three small ponds in the watershed which total 3.9 acres and, of course, Levings Lake. Apparently the whole story of this 6,208 acre watershed has been one of erosion caused by poor land management; consequently, Levings Lake was doomed before it was built.

Three seine hauls taken upstream from Levings in 1968, disclosed the presence of 11 species of fish, the most abundant of which was the creek chub, followed by the white sucker and bluntnose minnow. Fishing pressure on this stream would be light due to its size and lack of game fish.

A pollution mortality was investigated in 1966. This mortality caused a complete loss of fish life from Meridian Road down stream to Levings Lake. An estimated total of 4,500 fish were lost, 98 percent of which were non-game. No other pollutional sources or mortalities are known to have occurred in this watershed. The primary pollutant at present is silt.

KILBUCK CREEK - T43N, R1E, S21SW¼; Surface Acres - 42.4; Miles - 5.0; (in county of 22.0); Average Width - 70 feet; Gradient - 20 feet/mile; Tributary to - Kishwaukee River.

From its origin southeast of Rochelle in Ogle County, Kilbuck Creek flows some 17 miles through heavily farmed land in a northerly direction, picking quite a silt load and enters Winnebago County in Section 36 of Rockford Township. Upon entering Winnebago County, it veres northwest and passes through Kilbuck Forest Preserve (142 acres) before its confluence with the Kishwaukee River seven-tenths of a mile east of Kishwaukee Road. During heavy rains the stream level will fluctuate as much as four feet. There is quite a delta deposited at the stream's mouth. At the time of a fisheries survey in 1965, (July) following a heavy downpour the previous evening, water visibility was only seven inches in an area that was over three feet deep.

The predominant bottom type is large rubble and boulders. Much of the stream bank is forested in the Winnebago County portion. Very little urban development has occurred in the 5,888 acre (of 32,000 acres) Winnebago County portion of the watershed. Rock out-croppings are common along the lower reaches of the stream and the area is quite scenic . It is hoped that the Forest Preserve District will acquire more of the land bordering this stream to insure habitat preservation.

Upstream in Ogle County lie several areas of slough, which may be utilized as spawning grounds by Rock and Kishwaukee river fishes particularly Northern pike.

The Delta and most of the narrow floodplain is underlain by mixed loam bottom and is somewhat boggy. There is some oxbow development in the area between Kilbuck and the Kishwaukee River. No ponds occur here other than a small 1.0 acre gravel pit.

Division of Fisheries personnel sampled Kilbuck Creek in 1965, with the sampling station being located in the forest preserve. As the result of this survey, the presence of 20 species of fish was recorded, the most abundant of which were the common shiner, horney head chub and stoneroller. Also collected were largemouth, smallmouth, and rock bass. Not collected but known to occur are black and yellow bullheads and channel catfish. Angler usage is heavy in the area of the forest preserve (1.2 miles). On the rest of the stream access is over private property.

Pollution is minimal in this basin due to its rural character. Silt is presently the most significant pollutant and if left unchecked will eventually destroy the smallmouth habitat..

NORTH KINNIKINNICK CREEK - T46N, R2E, S33NW¼; Surface Acres - 15.8; Miles - 6.5; Average Width - 20 feet; Gradient - 36.5 feet/mile; Tributary to - Rock River.

This steep gradient stream has its origin on the east side of the Rock River slope, near Route 76, in Boone County. This portion of the watershed is mostly in permanent pasture and drains 9,600 acres. The stream enters Winnebago County on Goodwin Road, one tenth of a mile south of Rockton Road. From this point it flows in a general southwesterly direction and passes through the Ledges County Club before emptying into the Rock River on the north edge of Roscoe.

The 3,280 acre Winnebago County portion of the watershed flows through a relatively narrow drainage basin seldom more than one mile in width. Permanent pasture also predominates in this area and is interspersed with tracts of hardwood timber. Considerable urban development has occurred in and around "The Ledges".

The maximum depth of the stream is three feet with an average of 15 inches. Heavy runoff is known to cause a water level of fluctuations in excess of three feet causing some flooding in low areas. Only four ponds occur in the basin, totaling 15.6 acres and three of these are located on "The Ledges" Golf Course.

Aquatic vegetation is represented by water buttercup, American Elodea and leafy pondweed. The normal stream bottom is gravel sand and rubble yet much of it has been buried by alluvial silt deposition. The stream maintains a permanent flow throughout its length in Winnebago County and very little wet land is found within its confines.

Seine hauls taken during the 1965 survey of the Rock River basin revealed the presence of a total of 17 fish species, the most abundant of which were the common shiner, bigmouth shiner, stoneroller and the white sucker. Also known to occur downstream near the mouth are carp, channel catfish, buffalo and smallmouth bass. Of special note is the occurrence in this stream of the ozark minnow, a species quite rare in northern Illinois.

There is no history of stream pollution in this watershed and due to the recent development of "The Ledges" using modern septic facilities approved by the County Health Department, there should be little problems in the near future. As these systems age, there may be failures and subsequent pollution.

Dawes (and Terstriep 1967) mentions the possibility of creating a reservoir on this stream, the dam of which would be located just west of Crockett Road and east of "The Ledges". This dam would run in a north and south direction and be 900 feet long. If impounded at elevation 840 M.S.L. it would create a reservoir of 486 acres having a maximum depth of 50 feet and 8 miles of shoreline.

The uplands surrounding this lake site are presently in timber cover and could be developed into excellent park land. The Illinois Water Survey considers the site feasible subject to verification by test borings to determine if solution channels are present in the bedrock. Since this lake site is multi-county in nature it would behoove the Winnebago County Forest Preserve District and Boone County Conservation District to share the cost of developing it.

<u>SOUTH KINNIKINNICK CREEK</u> - T46N, R2E, Section - 33SW¼; Surface Acres - 5.5; Miles - 4.5; Average Width - 10 feet; Gradient - 35.6 feet/mile; Tributary to - Rock River.

A relatively small portion (3,584 acres) of this watershed is in Winnebago County. Most of its 15,104 acre watershed lies in Boone County.

South Kinnikinnick Creek has a moderately steep gradient flowing in a three foot deep notch which it has cut into the flood plain. In enters the county near the junction of Lovesee and Burr Oak Roads and follows an almost due west course emptying into the Rock River in the Village of Roscoe.

The land use in the area is a mixture of row crops, pasture and woodlands with the latter two predominating. There has been some estate type development in the lower portion of the basin. The predominate bottom types are gravel and rubble with some sand and boulders. The maximum depth is six feet and it averages three. Considerable snake like meanders occur throughout its length as well as many springs. The primary aquatic vegetation is elodea and watercress. Three to four feet rises in water levels are common following heavy runoff.

Seine hauls in 1968 collected a total of 16 species of fish. The most abundant of which were the redbelly dace, common shiner and creek chub. White suckers are also fairly abundant and downstream near Roscoe, carp, bullheads, channel catfish and smallmouth bass are sought by anglers. A stocking of smallmouth bass was carried out in the Boone County Forest Preserve in 1968, and while the number was small, it may eventually provide some fishing for this species downstream in Winnebago County. Of note is the occurrence of the slimy sculpin and blacknose dace, both of which are rare in northern Illinois.

Little or no pollutional sources exist with the possible exception of agricultural runoff and livestock enrichment. Due to the rapid runoff from the upper watershed, the silt load is quite pronounced following heavy rains.

There are two potential reservoir sites along this stream, one lies in the Kinnikinnick Creek Conservation Area in Boone County and would create a lake of 237 acres. The other side is considerably smaller and is located in the vicinity of Burr Oak Road. The dam would have to be 700 feet in length paralleling Burr Oak Road. If constructed at the proposed elevation of 840 feet M.S.L., a lake of 83 acres with a maximum depth of 50 feet would be created. The site is considered to be feasible, however, test borings would have to be taken to determine the possible occurrence of solution channels in the dolomite. Due to the small size, this impoundment would probably be best suited to private development.

KISHWAUKEE RIVER - T43N, R1E, Section 21SW¼; Surface Acres - 303.2; Miles - 20.0; Average Width - 125 feet; Gradient - 36.7 feet/mile (South Branch and Main Stream); Tributary to - Rock River.

The Kishwaukee River main stream runs for a total of 10 miles through the county, receiving the waters of the north and south branches at Prairieville Road. The north branch leaves Boone County 1/8 of a mile north of the Illinois Tollway near the village of Cherry Valley and falls a total of three feet from this point to its confluence with the south branch. The average width of the north branch of the river is 110 feet. The average width of the south branch is 95 feet. The south branch enters the county at the extreme southeastern corner and has a much steeper gradient falling a total of 22 feet in 5.5 miles. Depths vary greatly throughout its length in the Winnebago County. The main stream has a maximum depth of 11 feet and average of three feet. An area created by gravel-sand mining on the south branch near the junction of Bloomberg and River Roads known locally as "Blue Hole", and is

reputed to be 20 feet deep. The only major tributary to the Kishwaukee River in Winnebago County is Kilbuck Creek, nevertheless, several named creeks which are largely intermittent also drain its 28,800 acre Winnebago County watershed. These streams will not be covered individually in this report. Their names are Manning Creek entering the river in the northeast one half Section 36 of Rockford Township, Madigan Creek which enters the river southwest of Cherry Valley in Section 2 of Cherry Valley Township and Evans Creek entering the main stream just south of the Rockford Airport in Section 27 of Rockford Township. Three drainages enter the river from Boone County, they are Burger, Hackey and Mayberry creeks.

Only two pollutional sources exist in the Winnebago portion of the stream. These are at Cherry Valley and New Milford, yet no fish mortalities have been reported for this portion of the stream. A 1965 report on the Kishwaukee River Basin makes note that since 1955, Division of Fisheries' biologists have investigated a total of 23 fish mortalities in the Kishwaukee basin. Seven more have occurred since 1965, bringing the grand total to 30 as of 1970, with the total number of fish lost approaching one million. The Kishwaukee has shown a strong tendency to recuperate from these losses provided the source is not chronic. In recent years, the towns along the North Branch have been upgrading their treatment facilities and water quality testings carried on yearly since 1960 have shown the water to be of good quality in the Winnebago County portion.

There are presently 10 small impoundments in the watershed with a total 16.4 acres, several of these are oxbows and there is one six acre borrow pit resulting from tollway construction.

The most common bottom types are on the main stream and its branches are gravel and rubble interspersed with pockets of alluvial silt. Riffle areas are also common. Several rock dams were constructed in the early 1930's by Civil Conservation Coop workers in the vicinity of the county's 145 acre Kishwaukee Forest Preserve. The county also owns two acres known as Hinchcliff Forest Preserve at the confluence of the Kishwaukee and Rock rivers. Camping is allowed at the Kishwaukee Forest Preserve and the area is a favorite launching site for canoeists.

The Rockford Park District maintains its 384 acre Seth Atwood Park just east of New Milford on the site of the Old Camp Grant Rifle Range. As a result of the two parks, the public has access to two miles of the river.

The 800 acre Mulford tract was originally proposed for inclusion into the State's Park system back in 1964; however, this proposal was rejected due to a lack of funds. The purchase of this tract would provide anglers and the general public with access to an additional two miles of the river including the confluence of the two branches with the main stream.

Data in Division of Fisheries files show that the river was sampled in the vicinity of the Kishwaukee Forest Preserve four times in the past 10 years. (See Appendix #1). The earlier samplings were carried out as a part of a study of Illinois smallmouth streams. A sampling in the 1965 was undertaken as part of a complete watershed survey of the Kishwaukee basin. As a result of these surveys we recorded the presence of 32 species in the main stream. The northern redhorse sucker, common shiner, sand shiner and smallmouth bass were the most numerous species in the samplings.

While the data from the four collections is not completely comparable due to variations in area and time allotted per sampling it becomes clear that in 1960 and 1961, good hatches of smallmouth and rock bass were produced. The data in 1965 would seem to show that this was not the case that year. Walleye were also quite abundant

in the 1960 sampling and their abnormal abundance is traceable to the large crop produced in 1959 in the whole Rock River basin due to optimum spawning conditions (Rock 1969).

An interesting observation from these samplings is the relatively low numbers of channel catfish taken at this station. Summarizing all four collections, one arrives at a total figure of 14 channel catfish. This species, while relatively hard to sample using electro-fishing gear, shows a much higher occurrence in the 1960 sampling in Boone County below the Belvidere Dam. Since both samplings were carried out at roughly the same time of year, the author would tend to believe that this species is presently less abundant in the Winnebago County portion of the stream than it used to be according to anglers.

Carp, which are fairly abundant in the area near Kishwaukee Forest Preserve, were represented by only 37 fish in two collections.

Other important sport fish in the Kishwaukee River are rock bass, black crappies and northern pike. Walleyes are insignificant.

Due to the installation of a new sewage plant at Cherry Valley and the upgrading of facilities upstream in the Boone and McHenry County portions, it is hoped that water quality will continue to improve and also the ratio of game to other fish. A good project for concerned citizens would be the placement of more rock dams throughout the stream's length. This may increase the game fish habitat.

MCDONALD CREEK - T45, R2E, S8NE¼; Surface Acres - 1.2; Miles - 8.1; Average Width - 5.0 feet; Gradient - 39.2 feet/mile; Tributary to - Rock River.

This moderately steep gradient stream has two forks both of which are intermittent in nature. Being 3.0 and 3.1 miles in length respectively. They conflue with the two mile main stream at the junction of McDonald and Swanson Roads.

The 5,120 acre watershed runs almost straight east and west being roughly two miles in width. Once the stream leaves the Rock River Terrace, it sinks below the ground. The stream bed in the upper watershed is composed primarily of gravel and alluvial silt. From McDonald Road downstream to the mouth, the bottom is lined with almost pure sand. A small slough pocket 0.2 of an acre in the vicinity of Belvidere Road is the only impoundment found in the watershed. At one time this watershed was heavily timbered. The present use is row crops and permanent pasture. Cattle were seen wallowing in the stream and the banks were trodden down and slumping. It flows in a one to two foot notch throughout most of its length. Below Route 51, the watershed has been urbanized to some extent with all the facilities on septic tanks, some quite old.

The maximum depth found is two feet and the average one. Following heavy runoff the stream is known to rise two to three feet above normal, leaving its banks in many areas. The floodplain soils feature moderate to rapid sub-surface drainage, hence, the lack of a permanent flow.

Three seine hauls taken in 1968 failed to collect a single fish. Due to its intermittent nature, this stream gets no fishing pressure. No pollutional sources are known to exist; however, due to the steep gradient and permeability of the soils extreme care should be taken with agricultural sprays.

MILL CREEK (West Fork) - T26N, R10E, S34SW¼; Surface Acres - 4.9; Miles - 10.3; Average Width - 15 feet; Gradient - 38.2 feet/mile; Tributary to - Rock River.

This steep gradient stream is represented in Winnebago County by the head waters of its three branches. The east fork is four miles long, leaves the county in the southeast ¼ of Section 32 of Winnebago Township and is completely intermittent. The middle branch arises just south of the Illinois Central Railroad tracks and leaves the county on Montague Road in the southeast quarter of Section 36 of Seward Township. This fork is also completely intermittent. The west fork which is actually the main stream and largest of the three has a permanent flow for approximately two miles of its length. This branch originates just north and east of the village of Seward and dog-legs slightly to the east before leaving the county 3/4 of a mile west of the junction of Montague and Couger Roads.

The predominate bottom type along the stream is sand and gravel with some rubble and silt. Most of the watershed is intensively farmed in field crops with scattered pastures and wood lots interspersed throughout. There are many springs in the area and watercress is quite abundant, providing a 30 percent coverage of the stream bottom at most localities. There is but one impoundment known in the 12,928 acre watershed. Dawes makes mention of a potential reservoir site on the west fork just south of the Ogle County line.

The Winnebago County portion of the stream was sampled on the west fork, just north of Montague Road. Two seine hauls taken in the fall of 1968 revealed the presence of 13 species of fish, the most abundant of which were redbelly dace, common shiners and bluntnose minnows. Also abundant were white suckers.

The Ogle County portion of the stream was stocked by the Department of Conservation for many years with brown trout. These fish have carried over and some reproduction has apparently occurred. Since as recently as 1965, the author has seen catches of one-half to six pound brown trout taken upstream from Byron.

No pollutional sources are presently known along the Winnebago County portion of the stream; however, if the Village of Seward should expand and require a treatment plant, the west fork most likely will be the receiving stream.

MOSQUITO CREEK - T26N, R11E, S35SE¼; Surface Acres - 1.7; Miles - 3.6; Average Width - 4.0 feet; Gradient - 38.9 feet/mile; Tributary to - Rock River.

This steep gradient stream originates just north of the junction of Westfield and Edwardsville Roads. From this point it runs in a southeasterly direction leaving the county at Weldon Road and enters the Rock River one-half mile east of Meridian Road in Ogle County.

The upper watershed is primarily open pasture with very little tree cover except in the lower two miles. The maximum depth is five feet and average is two feet. The predominant bottom type is silt with localized accumulations of sand, gravel and rubble.

This stream is entrenched four to six feet in a flood plain approximately 25 miles wide. There are many muskrat burrows in the banks causing them to slump and much undercutting is visable. At present only two impoundments exist in the watershed, totaling 3.1 acres.

Dawes and Terstriep (1967) mention the possibility of locating a 173 acre impoundment in the Ogle County portion of the watershed. If constructed at the proposed 760 feet M.S.L., the lake would have 60 feet of depth at the dam and would back water into Winnebago County.

Seine hauls taken at Montague Road in 1968 disclosed the presence of 14 species of fish; the most abundant of which were the redbelly dace and bluntnose minnows. White suckers and green sunfish were also present. The presence of these two species makes it imperative to rehabilitate the water shed prior to filling the proposed impoundment. There is no known pollutional source and no fish mortalities have been recorded for this stream. Erosion caused silt is presently the primary pollutant.

MUD CREEK - T45N, R1E, S25NW¼; Surface Acres - 1.8; Miles - 4.1; Average Width - 13 feet; Gradient - 46.3 feet/mile; Tributary to - Rock River.

This steep gradient stream originates near the junction of Glikeman and Latham Roads. From this point, it flows in a general southeastern direction entering the Rock River one half mile south of the junction of Old River Road and Illinois Route 2. Its drainage basin has a land use pattern in which cropland predominates followed by livestock grazing.

The predominant bottom type is silt which averages four feet in depth. In areas where the stream has cut through the silt, it exposes the characteristic sand and gravel bottom of most Rock River streams. Many springs enter the stream in the vicinity of Owen Center Road where it is only one foot wide and choked by large patches of watercress.

Downstream from Route 2, there is a dense stand of bottomland, hardwoods covering the floodplain. Mud Creek is known to rise five feet above normal following heavy runoff. There are six ponds presently located in the watershed totaling 3.8 acres.

Due to its relative inaccessibility sampling was rather difficult. All that is known to occur is the green sunfish; however, the normal complement of minnows is most likely also present. There is moderate fishing pressure at the Route No. 2 bridge; however, upstream from this area, the stream becomes too narrow to accomodate much in the way of fishing. No pollutional sources or history of fish mortalities are known from this stream.

OTTER CREEK - T28N, R11E, S4NW¼; Surface Acres - 28.1; Miles - 19.3 (see below); Average Width - 12 feet; Gradient - 21 feet/mile; North Branch - Tributary to - Sugar River.

This moderate gradient stream originates in Green County in Wisconsin and enters Winnebago County at its highest point of 990 feet M.S.L., in the extreme northwestern corner. The North Branch flows for eight miles in a southeasterly direction picking up the 6.5 mile South Branch on the east side of Durand, in the vicinity of Wheeler Road. Four and eight-tenths miles due east from this point the stream has its confluence with the Sugar River in the county's 323 acre Sugar River Forest Preserve.

The stream's width varies exceedingly with a maximum of 25 feet in the lower portion to five feet maximum upstream. Pools up to seven feet deep are common along the mainstem; however, an average depth of three feet is common throughout.

The bottom is composed mainly of silt in the area east of Durand. As one proceeds west, the stream rises abruptly and the bottom changes to one of gravel, sand and rubble.

During times of heavy precipitation and with the onset of spring thaws, the stream rises from six to ten feet causing flooding in many areas. Parts of the North and South Branches and also the main stem in the vicinity of the mouth have been dredged and straightened. There is much pool-riffle development along the upper watershed.

The 19,840 acre watershed drains an area of loess covered bedrock hills with bedrock less than 10 feet below the surface in most places. The land use character is primarily pasture in the upper watershed and row crops in the lower. Many medium sized woodlots are intersperced throughout the area, making it quite scenic.

At present, there are nine ponds totaling 12.2 acres in the Winnebago County portion of the watershed and two in Stephenson County, totaling 1.5 acres.

A composite of five seine hauls taken on the main stream and the North and South Branches indicated the presence of twelve fish species of which the johnny darter, creek chub and bigmouth shiners were the most abundant. Northern pike, largemouth and smallmouth bass are known to be moderately abundant in the lower reaches of the stream. Public access is restricted to road bridges.

There are a total of five possible reservoir sites in this watershed, one of which has already been developed, the 275 acre Lake Summerset, just west of Best Road on the South Branch. Back in the early 60's, the Federal Soil Conservation Service surveyed a possible 230 acre reservoir on the North Branch for flood control; however, the cost benefit ratio was such that the project was dropped in 1968. Dawes and Terstreip (1967) in their publication make mention of a 326 acre site also on the North Branch with the dam located just west of Bert Road. This reservoir is presently being considered for development by Boisie-Casscade, the developers of Lake Summerset. If constructed at the proposed 830 feet M.S.L. level the lake would have a maximum depth of 40 feet and back water into Stephenson County. The creation of these two lakes should help to reduce the flood damages downstream.

The only known fish mortality on the stream took place in June, 1963, involving an estimated 49,434 fish valued at $2,832.00 weighing heavily in the kill were northern pike. The cause of this mortality was traced to milk and cheese waste from plants located in both Davis and Durand. Both of these plants have now gone out of operation. If at all possible, the portion of the creek downstream from Wheeler Road should be placed in public ownership or trespass rights leased to enhance fishermen access to the stream.

PECATONICA RIVER - T46N, R1E, S23NW¼; Surface Acres - 640.0; Miles - 34.0; Average Width - 156.3 feet; Gradient - 0.4 feet/mile.

This rather sluggish very low gradient stream drops a total of 15 feet from the Stephenson County line to its confluence with the Rock River in the 214 acre Macktown Forest Preserve at Rockton. In the upper reaches, the stream averages 120 feet wide; however, after receiving the waters of the Sugar River in Shirland it broadens out to 220 feet from this point downstream to this mouth.

The 2,540 square mile Pecatonica Basin originates in an unglaciated region in Iowa,County, Wisconsin. The stream meanders snake like throughout its 150 mile length including 76.5 miles through Stephenson and Winnebago counties in Illinois.

Floodplain spreads out to a width in excess of three miles in some parts of Winnebago County and features very rich soils, accumulated during the "Lake Pecatonica Phase" of the Wisconsin glacial lobe. Many oxbow lakes have been formed along the stream. Thirty-eight of these are found in Winnebago County with a total surface area of 220.8 acres. There is also much slough land associated with the stream.

The primary bottom type is silt and sand throughout with the exception of the portion immediately upstream from the mouth where the stream has cut through to the bedrock and has large boulders and rubble as a bottom type. For the purpose of this report, the watershed of the Winnebago County portion of the stream, excluding its major tributaries will be considered to be 55,040 acres. Included in this total are several, largely intermittent, named tributaries which will not be discussed individually. They are Hungry Run, which enters the stream in Section 32 of Harrison Township, Tunnison and Rhule creeks entering in Section 28 and 25 of Harrison Township, respectively; Sugar Creek, which enters the river in Section 11 of Shirland Township and Gleason Creek which enters in Section 30 of Rockton Township. Much of the floodplain is intensively farmed, although, the stream in most places is bordered by bottomland hardwoods.

Based on sampling evidence from five collections between 1960 and 1968, 31 species of fish are recorded for the river. (Appendix 2) The most abundant fish in these collections were minnows, the redfin and common shiners. Also quite abundant in the samples was the channel catfish, especially in the section between Rockton and Harrison. Walleye have been found all the way upstream to Ridott in Stephenson County being most abundant near Rockton in 1960, the year following, the record spawning in Rock River Basin (Rock 1969).

Smallmouth and rock bass occur in numbers only in the area of gravel bottom near the mouth, however, they also have been sampled upstream at Ridott. White and black crappies based on sampling evidence would seem to be more abundant from Harrison downstream. Our collections did not reveal the presence of large numbers of flathead catfish; nevertheless, they figured highly in a fish mortality which occurred in the spring of 1969 and seem to be much more abundant than our data would indicate. Northern pike are present throughout the length of the stream but due to the inefficiency of sampling gear little can be said concerning their abundance. Buffalo carp and redhorse are quite abundant in all areas as are quillback carpsuckers.

During many years in late February and early March, ice jams occur causing the river to escape its banks. Water level fluctuations in excess of ten feet are common. There was extensive and prolonged flooding in 1959, 1960 and 1968. During a 1960 survey, the river level was noted to be at its lowest level since 1932.

Quite a few fish mortalities have occurred in the Stephenson County portion of the stream; however, dilution was sufficient to restrict the kills to that county in most instances.

In 1969, an extensive fish mortality occurred in the portion downstream from Route 70 to the mouth. This mortality involved an estimated 172,790 fish with an approximate value of $84,167.60. Channel and flathead catfish weighed heavily in the kill which was comprised of 88 percent game fish. Since this mortality occurred during the winter under ice cover it went unnoticed for almost a month and therefore the exact cause could not be determined. Later information indicated it could have extended all the way up stream to Ridott, a distance of 36 miles.

Public access to the stream is limited to Macktown Forest Preserve at its mouth, a strip of land between Harrison and Shirland on the west bank owned by the State Highway Department, the newly acquired Pecatonica Forest Preserve on Brick School Road, three miles northeast of Pecatonica, and a small city park in Pecatonica. The Winnebago County Forest Preserve District is presently considering the purchase of another site somewhere between its Pecatonica and Macktown Preserves to further enhance the river for anglers and canoeists.

PINK CREEK - T27N, R10E, Section 7SW¼; Surface Area - 5.5 acres; Miles - 9.0; Average Width - 5 feet; Gradient - 24.4 feet/mile; Tributary to - Pecatonica River.

This moderately steep gradient stream originates on the north slope of Pecatonica basin, just south of Route 75. From this point, it flows due south with its eastern boundary generally being Starver Road. The western boundary of the watershed is the Stephenson County line. Approximately 0.5 mile south of Trask Bridge Road, the watershed bends sharply to the west, following a southwesterly direction to the point where it leaves the county at Brick School and Goeke Roads. Pink's Creek enters the Pecatonica River approximately 1.5 miles west of the Winnebago County line, near the Farwell Road Bridge. There is considerable relief in the basin with elevations reaching 920 feet. The watershed is constructed from a series of dissected morainal hills, the land use of which is primarily permanent pasture with some row crops and small woodlots. Cattle wallow in the stream in some localities and other portions have been dredged and straightened, causing it to carry a heavy silt load. In the upper portion of the watershed, the stream has a characteristic bottom of sand and gravel and lies in a two foot trench; however, as the stream nears the county line, the bottom is covered by a two foot thick deposit of fine black silt.

During the course of sampling in 1968, many water fleas and fingernail clams were seen. Depth varies from a maximum of three feet to an average of one foot. At present, the 6,720 acre watershed contains only one pond which is 1.2 acres in size.

Seine hauls taken in 1968 at two locations along the Winnebago County portion of the stream collected a total of ten species of fish, which were mostly forage minnows, the most common of which were the bluntnose minnow, northern creek chub, bigmouth shiner and brook stickleback.

There are no known sources of pollution; although, some enrichment is added by domestic stock which are allowed access to the stream. The primary pollutant at present is silt.

Angler utilization of the stream would be minimal except for the seining of minnows.

RACCOON CREEK - T46N, R1E, S22SE¼; Surface Area - 16 acres; Miles - 6.6 (in the county) Average Width - 20 feet; Gradient - 15.1 feet/mile; Tributary to - Pecatonica River.

This watershed has a moderate gradient and originates in the highlands of Rock County, Wisconsin, near Afton. It enters Illinois approximately one mile east of Sharp Road and flows in a general southeasterly direction to its confluence with the Pecatonica River six-tenths of a mile west of Macktown Forest Preserve.

Depths vary from a maximum of seven to an average of three feet. Quite a few slough areas exist in the 9,960 acre watershed and are known to be used in the spring by carp, buffalo, walleye and northern pike as spawning and nursery areas. Near the Wisconsin line, the stream has a gravelly, sandy bottom with many sand spits extending out into the water course. From Yale Bridge Road downstream to the mouth, the stream banks are heavily wooded; the stream meanders considerably and the bottom type changes to fine sandy silt.

There are presently eight impoundments in the watershed which inundate a total of 7.3 acres. The largest of these is the Tall Oaks Subdivision Pond.

Sampling in 1968, using a minnow seine collected a total of six species in the upper watershed, the most abundant of which was the sand shiner, followed by the bluntnose minnow. Due to its inaccessibility, the lower portion of the stream could not be sampled. In spring, anglers are reported to wade upstream from the mouth taking smallmouth bass, northern pike, crappies, carp, buffalo and an occasional walleye.

There have been no known fish mortalities traceable to this stream, nevertheless, septic drainage from Tall Oaks Subdivision could possible become a problem during times of flooding.

ROCK CREEK - T43N, R1E, S19SE¼; Surface Acres - 7.0; Miles - 6.2; Average Width - 10 feet; Gradient - 30.6 feet/mile; Tributary to - Rock River.

This moderately steep gradient stream originates on the west slope of the Rock Terrace in the vicinity of the junction of Weldon and Kelly Roads. From this point, it flows in a general southeasterly direction to its confluence with the Rock River one-half mile south and east of Fuller Forest Preserve.

Most of the upper watershed is in field crops. There is also a chicken ranch in this area. The 5,631 acre watershed is primarily made up of an area of Ordovician dolomite hills. The relief in this area is between 30 and 40 feet with the stream meandering snake-like through a floodplain which averages 350 feet wide.

The typical bottom type is silt with a mixture of sand and gravel. Depth ranges from a maximum of three feet to an average of one foot. During time of high runoff water level rises of four feet are known to occur. Cattle and sheep are known to wallow in the stream. The floodplain is primarily underlain by mixed loam bottom, which is poorly drained and tends to be boggy.

Stream sampling in 1968 disclosed the presence in the middle portion of fish species, the most numerous of which were southern redbelly dace, and common and bigmouth shiners. White suckers are also present and moderately abundant. Little or no angler pressure occurs on the stream due to its size and lack of game fish.

Other than siltation from agricultural land the only known possible source of pollution would be drainage from the chicken ranch and adjoining subdivision south of Simpson Road.

Dawes and Terstriep in their 1967 publication on potential reservoir sites show the possibility of constructing a 237 acre lake on this stream. The 700 foot dam would be located just north of and parallel to Fitzgerald Road. This impoundment would have a maximum depth of 40 feet if constructed at the recommended 740 foot M.S.L. contour.

Since the city of Rockford will eventually annex this area due to expansion, the Rockford Park District has considered this site for eventual incorporation, as soon as funds become available. The site is also included in the Metropolitan Rockford Open Space Plan. (Defillipes et al. 1969).

<u>ROCK RIVER</u> - T43N, R1E, S30NW¼; Surface Acres - 1,642.5; Miles - 33.6; Average Width - 403.3 feet; Gradient - 1.4 feet/mile; Tributary to - Mississippi River.

The Rock River Basin includes part of southern Wisconsin, all of North Central and most of Northwestern Illinois. The 10,820 square mile basin is divided almost equally between Illinois and Wisconsin. The Illinois portion covers 5,310 square miles and varies from 25 to 60 miles in width with the widest portion occurring roughly along the path of Route 20 in line with Rockford.

The stream enters the county in Section 6 of Rockton Township at an elevation of 730 feet M.S.L. From this point it winds its way almost due south through the eastern half of the county passing through the cities of South Beloit, Rockton, Roscoe, Loves Park and Rockford, leaving the county in Section 30 of Rockford Township at the county's lowest elevation which is 685 feet M.S.L. dropping a total of 45 feet in 33.6 miles.

The typical stream bottom would be one of sand, gravel and large rubble. In many areas this bottom has been covered by from one to four feet of sandy silt. The maximum depth of the River in Winnebago County is not known, yet pools in excess of twenty feet are said to occur. Most of the stream tends to vary from five to fifteen feet.

The floodplain is roughly eight miles wide where it enters Winnebago County, constricts to 0.5 mile as it approaches Loves Park and widens out to three miles south of Rockford. This constriction in the floodplain in the area of Loves Park has caused some flooding in residential areas as recent as 1971 during the winter when ice-jams occur.

There is considerable island development throughout the Winnebago County portion of the river. One of the largest of these is Blackhawk Island located on the southeast edge of Rockford, near the Greater Rockford Airport.

Due to the heavy silt load the stream is quite turbid with water visability seldom exceeding 15 inches. The occurrence of many sewage out-falls along its banks has greatly enriched the river and this along with natural fertility has combined to produce nuisance alga blooms during most summers. The lack of clarity not only impedes the ability of sight feeding fish to feed properly, but anglers catch primarily fish which feed by smell rather than sight, such as catfish, carp and buffalo.

The high gravel content of the floodplain soils is due primarily to deposits following the retreat of the Wisconsinan Glacial Lobe and many operating gravel pits occur in the floodplain throughout its length. The actual Winnebago County drainage basin of the river disregarding its main tributaries is 36,485 acres. This would generally include only the floodplain and a small amount of the terrace.

The Rock varies exceedingly in width, entering the county 300 feet wide, it reaches its maximum width of 520 feet on the north edge of Loves Park, roughly at Windsor Road and leaves the county 450 feet wide. The narrowest portion of the stream (210) occurs in the vicinity of Atwood Homestead Forest Preserve.

From a total of seven collections made during the 1960's at five separate locations the occurrence of 45 species of fish has been documented for the Winnebago County portion of the Rock River. Based on our sampling data which has been very limited (see Appendix Number 3) the top four species relative to abundance and uniform occurrence at all sampling stations are the carp, white suckers, quillback carpsucker and northern redhorse sucker. Included among the most abundant species is the channel catfish, a fish which is rather difficult to sample but is known to occur throughout the river system and plays heavily in the anglers' catch.

In reference to game fish, channel catfish would top the list in abundance; smallmouth bass are much more abundant than most anglers realize but seem to occur only in areas where the bottom is quite hard and strewn with rubble. This species seems to be most abundant below the Rockford Dam and in the vicinity of Latham Park.

According to Leo Rock (1969) following a six year study of the river's walleye population, the last optimum spawning occurred in 1959 and the population has since steadily decreased. The stocking of this species has been proposed many times; however, due to the size of the stream, degradation of the habitat and the wealth of scientific data concerning the fate of planted fish in natural environments, this kind of a project does not seem economically feasible or biologically justified.

While northern pike occur throughout the stream, they seem to be most abundant below the dams and at the mouths of the larger tributaries.

Crappies, bluegill and other sunfish have a scattered occurrence but seem to be most abundant upstream from Loves Park.

The drum has been collected at most stations but is not thought to occur in very large numbers. Conversely, the flathead catfish which was collected only in the vicinity of Blackhawk Park is much more abundant than our data would show.

Pollution in the Rock River basin in Winnebago County is well documented and will be discussed in a later section in more detail. The Division of Fisheries records show that there have been twelve fish mortalities in the Winnebago portion of the Rock River between 1958 and 1970. Six of these mortalities occurred during 1963, a year of drought and extremely low water levels. The cause of some of the mortalities will never be known, others have been traced to cyanide wastes and other heavy metals. Along with the fish mortalities, fishery personnel have investigated other pollution complaints, ranging from oil slicks to chicken entrals floating on the surface. Many of the situations have since been corrected.

The Rockford Park District has nine parks which border the river; the largest of which are their Blackhawk and Sinnissippi Parks. The County Forest Preserve District has a total of four parks which border the stream, the largest of these being Atwood Homestead Forest Preserve. Due to the emphasis being placed on lakes and stream-side living it behooves public agencies to purchase as much of the remaining shoreline as is economically possible. Enlightened zoning should prevent the further construction of dwellings in depressed portions of the floodplain.

On May 23, 1970, a major clean-up of the Rock's shoreline took place from the Loves Park Bridge downstream to Blackhawk Park. Also included were the portions of Keith and Kent Creeks inside the Rockford city limits. The event, sponsored by the Rockford Chamber of Commerce, enlisted the aid of one thousand volunteers and over one hundred pieces of heavy hauling and other equipment. By the end of the day, 425 truck loads of logs and other debris, roughly nine hundred tons had been removed from the banks and islands.

SPRING CREEK - T44N, R1E, S13NE¼; Surface Acres - 1.7; Miles - 7.6; Average Width - 2 feet; Gradient - 27.6 feet/mile.

This moderately steep gradient stream originates on the Rock River slope approximately ½ mile each of the Boone County line near the junction of Paulson and Collins Road.

It flows through a rather narrow basin, draining 3,968 acres and is less than a mile and a half wide. Most of the stream is little more than two feet wide although in some places it swells to five feet. Shallow pools occur throughout but never exceed three feet in depth. Urban development has almost completely encrouched on the stream from Mulford Road downstream to the mouth one-half block north of the Auburn Street Bridge.

The predominate bottom type is sand, gravel and medium size rubble. Its banks are grass covered and feature scattered forest development. Only in the upper part of the drainage is there farm land and most of this is permanent pasture. The stream is routed around Rock Valley College Pond and Spring Lake Estates Lake. There are presently four impoundments in the watershed, totaling 14.6 acres, the largest of which is the twelve acre Spring Lake Estates Lake, the bottom of which had to be sealed with soil cement and clay so it would hold water.

Seine hauls taken in 1968 failed to disclose the presence of fish like. Following the rehabilitation of Spring Lake, which communicated with the stream during development, the following species were noted; bluntnose minnow, creek chub, horneyhead chub and carp. Angler utilization is negligible due to the stream size and a lack of game fish.

Most of the urban development has taken place within the city of Rockford and the homes are therefore sewered, reducing the chances of pollution. Considerable spring action occurs along the course of the stream and in these areas watercress is abundant. Other aquatic vegetation includes leafy and sago pondweeds with some elodea.

SUGAR RIVER - T28N, R11E, S14NW¼; Surface Acres - 313.0; Miles - 9.1; Average Width - 92 feet; Gradient - 1.1 feet/mile; Tributary to - Pecatonica.

This very low gradient stream arises in Iowa County, Wisconsin, southwest of Madison. From this point, it flows in a general southwesterly direction for 55 miles before entering Illinois two miles west of Hawley Road. The Wisconsin portion of the drainage includes a total of 693 square miles. The average flow is 17.2 c.f.s. The land use of this portion of the watershed is based on agriculture, primarily pasture for dairy herds. The northern portion of the drainage is in the unglaciated or driftless section of Wisconsin.

There are few lakes in the Wisconsin portion of the basin. The stream bottom is primarily sandy muck, although some riffle development does occur north of Yale Bridge Road. The stream has a very accentuated meander pattern and quite a few oxbows have developed along the Illinois portion. These oxbows vary in size from 0.7 to 15.0 acres and inundate a total of 28 acres. There are eight tributary streams which enter the watershed in Wisconsin; however, in Illinois it has but one tributary, Otter Creek.

The 17,280 acre Illinois portion of the watershed enters the county seven miles wide and angles to the southeast confluing with the Pecatonica River one-half mile north of Harrison and one-half mile south of Shirland. Most of the Illinois portion of the watershed is in pasture and woodlands with a small amount of row crops.

Many exotic plants found nowhere else in the county occur in the sand dune regions, making the mile and one-half of stream from Yale Road Bridge to the state line of great scientific value. Private groups and individuals have attempted to purchase some of this land to preserve it; however, it would behoove the Forest Preserve District to consider purchasing the remaining portion of stream and uplands of this area.

The stream is widely known throughout its course for producing smallmouth bass and channel catfish, not to mention northern pike and an occasional largemouth bass.

The only public land which occurs along the stream in Winnebago County is the 323 acre Sugar River Forest Preserve, northwest of Shirland, including 4,000 feet of stream bank.

In 1967, a South Beloit man won the state fishing contest with a 10.2 pound largemouth caught in the vicinity of the Forest Preserve.

The stream has been sampled only twice since 1960 (see Appendix 4) at two locations. From these samplings 22 species of fish were recorded. Based on this sampling evidence by numbers, the most abundant fish were common shiners, carp, channel catfish and northern redhorse. The smallmouth bass seem to be more abundant in the upper portion of the stream and this is also true of the channel catfish. In the 1960 sampling, 21 walleyes were collected, ranging in length up to 23 inches.

Seine hauls made by area herpetologists in 1962, disclosed the presence of large number of small northern pike in the pools above Yale Bridge, indicating this species to be more abundant than our samplings disclosed. Many of the oxbows contain goodly amounts of crappies, warmouth bass and pumpkinseeds.

All in all this river contains quite a compliment of game fish. Interesting is the absence of carp from collections in the vicinity of the Forest Preserve.

A 1964 publication for the Wisconsin Natural Resources indicates the existence of 21 possible pollutional sources in the Wisconsin portion of the watershed, 10 of which are sewage treatment plants, another seven arise from milk processing and cheese plants and the rest are industrial.

In the Winnebago County portion of the stream, the only possible source of pollution would be from the Durand Sewage plant, located on Otter Creek. No fish mortalities are known to have occurred in the Illinois portion of the stream.

SUMMER CREEK - T27N, R10E, S19SE¼; Surface Acres - 5.5; Miles - 6.0; Average Width - 15 feet; Gradient - 27.6 feet/mile; Tributary to - Pecatonica River.

This rather steep gradient stream arises on the south Pecatonica slope, two miles north of German Valley. From this point, it flows in a northeasterly direction. Its west fork drains several sections in the extreme southwest corner of Seward Township. It enters Winnebago County in the southwest ¼ of Section 31 of Pecatonica Township about ½ mile north of Route 20. At this point it also receives the waters of its main tributary, Grove Creek. Several rather large slough areas are located in the 6,080 acre Winnebago County portion of the watershed. After entering Winnebago County, it turns due north and follows this direction to its confluence with the Pecatonica River one mile northwest of Pecatonica.

There is much debris and deadfalls in the stream and cattle are known to wallow in it. It flows through a three to five foot notch and there is much slumping of the silty banks. Some of the pools are in excess of five feet deep; however, the stream would tend to average three feet throughout. All but three miles of the stream in Winnebago County are intermittent. A four foot rise in water level is common following heavy runoff.

The bottom type is predominated by silt over sand, gravel and rubble. Tree cover is lacking except in the vicinity of the mouth. Much of the watershed is in row crops except for some small areas of permanent pasture.

Five minnow seine collections taken in the fall of 1968 in the vicinity of Ridott Road disclosed the presence of seven species of forage fish, the most abundant of which were sand shiners and horneyhead chubs.

Due to the existence of large slough areas near the stream, it is likely that northern pike from the Pecatonica migrate upstream during the spawning season. Fishing pressure would seem to be negligible due to the absence of game fish and lack of public access.

There are presently two impoundments in the watershed, totaling 1.1 acres.

TURTLE CREEK - T46N, R2E, S6NE¼; Surface Acres - 12.7; Miles - 2.1; Average Width - 50 feet; Gradient - 11.9 feet/mile; Tributary to Rock River.

This moderately gradient stream originates as the outlet of Turtle Lake near Richmond in Walworth County, Wisconsin. From this point it travels east to the city of Delevan and turns abruptly to the west, picking up the Delevan branch and the drainage of Lake Delevan. The stream enters Rock County, Wisconsin near Fairfield, picking up the drainage of another fork near Sharon. From this point, it flows in a general southeasterly direction entering Winnebago County, Illinois a quarter of a mile east of the Chicago and Northwestern Railroad. Once it reaches the railroad tracks it turns abruptly west to its confluence with the Rock River one-fourth mile south of the state line. The stream is quite clear with visibility extending five feet. It has a rocky rubbley bottom and much tree cover along the banks.

The 1,260 acre Illinois drainage is through a heavily industrialized area with factories and junk yards lining both banks. This portion of the drainage has been for the most part cut off and run through storm sewers which eventually enter the stream one block from the mouth.

The whole area near the mouth is underlain by mixed loam bottom and the stream has cut a twenty to thirty foot channel through this material and at one point has exposed pre-cambrian bedrock. There are no impoundments in the Winnebago portion of the stream.

A series of eight seine hauls taken in 1968, under other than optimum conditions disclosed the presence of nine species of fish, the most abundant of which were spotfin shiners, northern redhorse and hogsuckers. Also collected were rock bass, bluegill, carp and smallmouth bass.

In Illinois, fishing on Turtle Creek is restricted primarily to the mouth with emphasis placed on suckers in early spring and carp and catfish later. Occasionally, walleye and northerns also enter the creek.

In a 1963 publication by the Wisconsin Department of Natural Resources, eleven possible pollutional outfalls are shown to enter the stream. These vary from sewage treatment plants to dairy and industrial facilities. Their survey gave me the stream a generally good bill of health and problems found have since been corrected.

The Illinois portion of the stream has its banks lined by broken concrete, trash and other discarded items. It is truly sad that the city of South Beloit has not seen fit to reserve this portion for park development as it is quite scenic despite the debris.

<u>WILLOW CREEK</u> - T45N, R2E, S19SW¼; Surface Acres - 9.9; Miles - 8.2; Average Width - 8 feet; Gradient - 26.4 feet/mile; Tributary to Rock River.

This moderate gradient stream originates in Boone County, just north of Caledonia. From this point it flows in a general southwesterly direction entering the town of Argyle and continues westward through Pierce State Lake, turning abruptly northwest in the vicinity of Forest Hills Road and enters the Rock River in the Rockford Park District's, Guy Williams Park three-fourth of a mile south of Ralston Road.

The predominate bottom type along the stream is one of sand, gravel and medium to large size rubble. The stream has cut a four to five foot notch through most of the valley. This notch becomes 50 to 60 feet deep below the Rock Cut dam, an area where it has exposed the ordovician bedrock. While it is permanent throughout it sinks into the sand deposits as it reaches the Rock River floodplain re-emerging near Route 51 as it approaches its mouth.

Most of the watershed is in permanent pasture; however, some row cropland does occur along with scattered woodlots. Its total watershed is 13,952 acres, 9,152 of which lie in Winnebago County. A moderate amount of spring activity occurs in this watershed and there are large beds of watercress in these areas. The most abundant species of aquatic vegetation is elodea followed by leafy and sago pondweeds along with some coontail.

The predominant soil types along the floodplain are mixed loam bottom and black mixed loam, both of which are relatively poorly drained. Much of the watershed contains a mixture of yellow-grey silt loam, brown silt loam, yellow silt loam and yellow sandy loam.

The stream drops off the Rock Valley slope and onto the floodplain at Forest Hills Road and this portion contains brown sandy loam on and over gravel.

All in all the watershed drainage tends to be moderate to rapid and in some instances excessive. This has a tendency to keep Pierce Lake overflowing its spillway during all but the driest months of the year.

Sampling stations were set up in 1968 above and below Pierce Lake. It is important to note that the area above Pierce Lake was treated with a fish toxicant prior to impoundment to eliminate the possibility of rough fish. In the collection taken upstream from the lake, four species of fish were found: white suckers, johnny darter, creek chub and bluntnose minnows. While downstream from the dam, 16 species of fish are noted, the most abundant of which are bluegills, bluntnose minnows and stonerollers. Also in the compliment below the dam are walleye, pike, largemouth bass, black bullheads and carp.

In the vicinity of the mouth, we have found pumpkinseed sunfish, northern pike and smallmouth bass. Many of the game fish which occur below the Rock Cut Dam represent escapement from the reservoir during times of heavy runoff.

Very little in the way of pollution occurs in this watershed. A major contributer was the grade school and homes and Argyle. A new treatment facility has recently been installed but not all homes are connected to this discharge. Thirty-eight outdoor privies are presently located in the confines of Rock Cut State Park. In order to protect the watershed and lake all of these facilities are equipped with 1,000 gallon sealed septic tanks which are pumped periodically to remove the waste.

Presently the State Conservation Department owns a total, including the lake, of two miles of the stream and has contemplated purchasing other acreage which will bring this total to five miles. Some of the new land contains a side branch of the stream upon which there is a potential two 30 to 40 acre reservoirs. An adequate series of test borings is needed to determine their water impounding capability.

SUMMARY OF INVENTORY DATA

The following section summarizes the data present in the preceeding pages, adding to it that which is contained in the appendixes following this report. The mere reporting of field data is meaningless without enlightened interpretation of it. The effect of man's impact upon his environment as he crowds himself into urban complexes is an important factor to consider when future land use and zoning patterns are being worked out by public agencies.

In many instances, the information contained in this report is derived from a single inspection of a given water area and may be from as early as 1951 (especially in relation to private waters). The frequency of field inspection by Conservation Department personnel on most public and organizational water areas has been largely dependent on the willingness of those in control of these areas to carry out needed corrective measure (eg. - aquatic vegetation or fish control, dredging, watershed management, etc.)

To focus attention on the existing status of the surface water resource in Winnebago County, the following broad topics will be considered in this section; population and economics, water resources, lake morphometry and origin, water quality, the fisheries resource, wetlands, public use and access, cottage and homesite development.

POPULATION AND AREA

The destiny of Winnebago County was sealed in 1818 when President Monroe signed the statehood enabling act which established our disputed northern border, making Winnebago County a part of Illinois (Nelson et al. 1968).

The first reported white man to ever camp on the banks of the Rock River was Ira Barker in 1824. He noted that there was a settlement of several hundred Indians near the river in the vicinity of Rockford. Following the defeat of Chief Blackhawk in 1832, settlers began moving into the area. Stephen Mack, the founder of Macktown, was the county's first settler arriving in 1829. Germanicus Kent and Thacher Blake staked their claims in 1834 on a site, which was later to become Rockford. By 1835, the new settlements totaled 27 persons.

In 1836, the legislature created the counties of McHenry, Kane, Winnebago and Whiteside. On March 4, 1837, the legislature approved the division of Winnebago to create the present counties of Stephenson and Boone. In 1848, Winnebago County was decreased to its present size of 332,800 acres (520 square miles), following a ruling giving part of its eastern edge to Boone County.

By 1850, Winnebago County had a population of 12,202. The industrial base of the county was already expanding and the area had become an important supplier of food, farm machinery and other goods by the mid 1850's. The county's population had increased to 47,845 by the 1900 census and reached 100,000 by approximately 1925.

Those interested in more details concerning the growth of this area are directed to the recently published history of Winnebago County, entitled "Sinnissippi Saga".

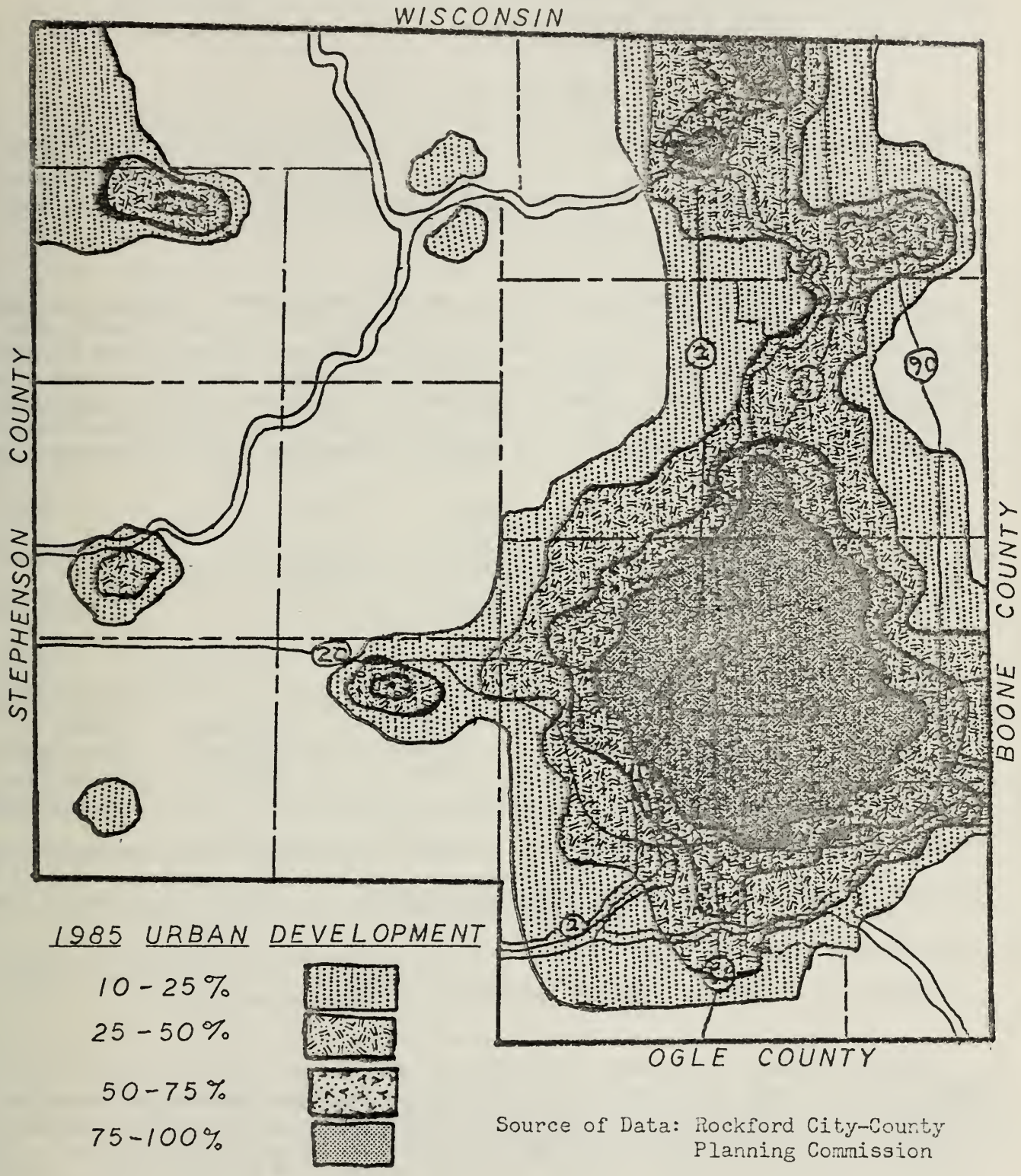
TABLE 4

Land Use Inventory For Winnebago County As Of June, 1968 *

CATEGORY	ACREAGE	PERCENTAGE
Residential (Rural and Urban)	35,088	10.5%
Manufacturing	331	0.1%
Transportation, Communication and Utilities	17	0.01%
Goods and Services	2,072	0.6%
Semi-Public Recreational and Cultural	1,946	0.6%
Resort and Group Camps	651	0.2%
Parks	1,371	0.4%
Agricultural Land	246,585	75.0%
Undeveloped Urban Land	19,198	5.9%
Non-Commercial Forest	7,012	2.1%
Water Areas Other Than Park Land and Streams	77	0.02%
Streets, Waterways and Railroad	18,452	5.7%
COUNTY TOTAL ACREAGE	332,800	100.0%

* Source of Data - Computer read out of unpublished data - Rockford City - County Planning Commission.

FIGURE 7.
PERCENTAGE OF URBAN DEVELOPMENT IN WINNEBAGO COUNTY — 1985



Source of Data: Rockford City-County Planning Commission

As can be seen from Table 4, the present land use is still predominately agricultural with 75% of the land area devoted to this activity. The next largest land use is for residential dwellings followed by undeveloped urban lands and streets, waterways and railroads. The land use data contained in Table 4 is very general and in relation to recreational land does not give a true picture. According to the city, county planning commission's report on open space (DeFilppis et al. 1969.) there is presently 5,506 acres of public and 4,792 acres of private open space recreational land. This gives us a grand total of 10,298 acres, which is roughly 3% of the total land area.

Industry and dealers in goods and services are presently utilizing 2,403 acres. The 1967 general plan for Rockford and Winnebago County shows that by 1985 an additional 13,600 acres will be needed for commercial-industrial enterprises and residential units. By and large, this area will be deducted from present agricultural lands and undeveloped urban land. This forecast also shows that by 1985, the county's population will require an additional 11,600 acres for parks, open space and community facilities.

The population of Winnebago County is already quite dense. Figure 7 depicts the predicted urban development by 1985. As can be seen from this figure, most of the development will occur along the Rock River Valley. Urban growth has already started on this course with subdivision development concentrated along most arterial roads leading from Rockford. Thoughtful planning should provide for an interspersing of park lands throughout this area to break up the pattern. Only by coordinated city-county-regional planning can this growth be channeled in the right directions.

TABLE 5

Population and Area Comparison of Winnebago County

To the State of Illinois

County and State	Area Square Miles	Population 1950	Population January 1970	Percentage Change 1950-70	Present Population Per Sq. Mi.
County - Winnebago	520	152,385	275,197*	+80.5	529.2
State of Illinois	56,400	8,712,176	10,850,600	+24.3	122.4

* Preliminary estimates, Rockford City-County Planning Commission.

Table 5, shows relationship of population density to growth for both Winnebago County and the State of Illinois for the past two decades. Winnebago County has had an 80% increase in population in the past 20 years where as the total increase for the state was only 24% for the same period.

Figures for 1970 are estimates of the present population. This data will be much firmer following the Federal Census scheduled to begin in April.

TABLE 6

Population and Percent Change Between 1950-1960 and 1960-1970

For Winnebago County, Rockford, its Largest City

and the Other Villages

County & Town	Population (Estimated for 1970) 1950	1960	1970	Percent Change 1950-60	Percent Change 1960-70
Winnebago County	152,385	209,765	275,197	+ 37.7	+ 31.2
Rockford	92,927	126,706	140,193	+ 36.4	+ 11.4
Loves Park	5,366	9,086	10,933	+ 69.5	+ 20.4
South Beloit	3,221	3,781	4,264	+ 17.3	+ 12.7
Rockton	1,432	1,833	2,163	+ 28.0	+ 18.0
Pecatonica	1,438	1,659	1,897	+ 15.3	+ 14.3
Winnebago	752	1,059	1,367	+ 40.8	+ 28.1
Roscoe	*	1,033	1,236	+100.0	+ 18.6
Cherry Valley	741	875	1,040	+ 18.8	+ 18.8
Durand	679	797	995	+ 17.3	+ 24.8
Morristown	*	402	812	+100.0	+104.5
Unincorporated Area	45,829	62,534	110,297	+ 36.5	+ 76.3

Data from Rockford City - County Planning Commission

* Unincorporated at Time of 1950 Census.

As can be seen from Table 6, the majority of the population is clustered in Rockford. In some instances data was not available for the population in 1950 due to the fact that some of the villages were not incorporated at that time. Rockford, while showing a 36 percent increase between 1950 and 1960, has tapered off during the past decade, showing only a 11.5 percent increase in population.

Loves Park, which had a 69.5 percent increase from 1950 to 1960 has had only a 20.5 percent increase during the past decade even though it annexed sizeable tracts of land. The same would hold true for most of the other villages in the county, with the exception of Durand and Morristown, which have had a faster rate of growth during the 1960's than in the 1950's.

Perhaps the most phenomenal increase has been in the unincorporated area. Population growth outside the city and village boundaries increased by 36.5 percent during the 1950's, however, this growth accelerated to a 76.3 percent increase during the 1960's.

Due to the pressures of modern society, many people have chosen the relative seclusion of the country for their place of domicile. During the past decade, land developers have pushed the idea of wood, lake and stream-side living as being the most appealing. Many city folks have bought this logic, hence, the great increase in rural residences. The only problem with this kind of growth is that it eats up large tracts of land at a rapid pace. Often, land that was best suited for recreational development.

TABLE 7

Preliminary Population Projections 1970 to 2020, For Winnebago County!

1970 - 275,197	1985 - 423,610
1975 - 310,480	1990 - 495,425
1980 - 361,424	1995 - 573,371
2020 - 871,545*	

! Cohart - Survival method using 1950-1960 migration rates.

* Authors projection based on the total increase from 1970-1995.

As the county's population becomes more dense and if the projections shown in Table 7 do come to pass, the area will certainly feel some growing pains in the next 40 years. At the projected 2020 population level, the density in Winnebago County will increase to 1,676 persons per square mile.

Ackerman (et al. 1967) estimates that the state's population will reach 13,000,000 by 2020. He also says that it is assumed that the population distribution will shift from the Chicago region to other parts of the state, Winnebago County being one of them.

In the city of Rockford in 1960 over 45 percent of the work force was white collar workers. The median family income that year was $6,865, placing a relatively large number of families within the medium to upper income brackets; however, 11.8 percent of the county's families were below the sustenance level ($3,000.00 annual income). As of the 1960 census, the aggregate income from the population of the county was $476,000,000.00. This is forecast to increase to $1,035,000,000.00 by 1980. The above stated information indicates that capital is present in the metropolitan Rockford area for the purchase and development of whatever recreational facilities are needed now and in the foreseeable future.

There has been a decline in Winnebago County's total number of farms in recent years. It has been roughly estimated that the county is losing 3,000 acres of farmland a year. The Assessors' Annual Farm Census shows a loss of 7,358 acres of farm land since 1967. As of January, 1970, the county had a total of 239,224 acres of farmland. During the same period the total number of farms had dropped from 1,502 to 1,262, a loss of 240 farms. The average size farm has increased from 164 acres to 182 acres. Many of these farms have been merely consolidated into larger tracts, a trend which is nation-wide in relation to farmland (Ill. Coop. Crop Rpt. Service 1967-69).

TABLE 8

Size Classes of Winnebago County
Water Areas

Streams Mean Width Entire Stream	Number	Total Surface Area (Acres)	Avg. Size Impoundments In Class (Acres)	Stream Length In County (Miles)
1.0 to 5.0 feet	8	16.0		50.2
6.0 to 10.0 feet	7	43.9		52.0
11.0 to 20.0 feet	9	105.8		75.3
21.0 to 50.0 feet	1	12.7		2.1
51.0 to 100.0 feet	2	355.4		14.1
101.0 to 200.0 feet	2	940.2		54.0
201.0 to 500.0 feet	1	1,642.5		33.6
Stream Totals	30	3,116.5		281.3
Impoundments (Acres)				
0.1 to 0.4	30	7.4	0.3	
0.5 to 0.9	50	33.1	0.6	
1.0 to 5.9	80	216.9	2.7	
6.0 to 9.9	11	75.9	7.0	
10.0 to 20.0	9	126.5	14.1	
21.0 to 100.0	4	113.7	28.4	
101.0 to 300.0	2	445.0	222.5	
Impoundment Totals	186	1,018.5	39.5	
Combined Total All Waters	216	4,135.0		281.3

WATER RESOURCES

In Winnebago County there are a total of 26 lakes and 160 ponds, which inundate 1,018.5 acres. Besides the above mentioned impoundments, 30 permanent streams occur within the county boundaries. Data presented in Table 8 shows that these streams inundate a total of 3,116.5 surface acres. By combining the totals for both impoundments and streams we arrive at a grand total of 216 water areas covering 4,135 acres or 1.2 percent of the county's land area. Winnebago County, as of 1970, ranks 76th and 53rd in the state in total number of impoundments and in acres of impoundments respectively. Its 26 lake size impoundments rank it, 41st in the state in acreage of lakes with 761.1 acres. Its 160 pond size impoundments rank it 56th in the state in acreage of ponds with 257.4 acres.

The county's lakes and streams are broken down according to size classes in the following table.

From Table 8, we can see that the vast majority of the county's streams are less than 20 feet wide; only three streams average wider than 100 feet - these being the Kishwaukee, Pecatonica and Rock rivers. By combining the total lengths of all the streams in the county we arrive at a figure of 281.3 miles.

Also from this data we find that the vast majority of the county's impoundments would average 2.7 acres or less in size. Shoreline information is only available for a very few impoundments so it will not be discussed here.

One important factor which can be readily seen in Table 8 is the lack of large recreational impoundments as only two of the county's lakes are larger than 100 acres, these being Pierce and Lake Summerset. Many of the lake size impoundments are oxbows along the Sugar and Pecatonica rivers.

As previously stated, lakes and streams can be classified by ownership under the following headings: state, public, organizational, private and fee.

TABLE 9

Class of Major Impoundments by Ownership,
Shape and Relative Amount of Shoreline Development.

	Name	Size	Shape	Public Access	Approx. % of Shoreline Development
		STATE			
1.	Pierce State Lake	162.0	Ob.	Free	None
2.	Rock Cut East Pit	0.5	Ob.	None	None
3.	Rock Cut West Pit	1.2	Ob.	Free	None
		163.7	Total No. 3		

TABLE 9 continued

	Name	Size	Shape	Public Access	Approx. % of Shoreline Development
		PUBLIC			
4.	Four Lakes' Forest Preserve	8.2	Rt.	Free	None
5.	Four Lakes' Forest Preserve	3.7	Rt.	Free	None
6.	Four Lakes' Forest Preserve	3.6	Rt.	Free	None
7.	Four Lakes' Forest Preserve	2.7	Rt.	Free	None
8.	Lake Victoria	16.5	Ov.	Free	None
9.	Levings Park Lake	23.5	Ob.	Free	None
10.	Martin Park Lagoon	1.7	Ov.	Free	None
11.	Rock Valley College Pond	1.8	Rt.	Free	None
12.	Sinnissippi Park Lagoon	0.1	Ob.	Free	None
13.	Tuttle Slough	4.3	Ob.	Free	None
		67.1 Total No. 11			
		ORGANIZATIONAL			
14.	Atwood Fish Farm Lake	15.1	Ob.	Perm.	None
15.	Atwood Fish Farm Lake	6.0	Ob.	Perm.	None
16.	Atwood Fish Farm Lake	5.0	Ob.	Perm.	None
17.	Atwood Fish Farm Lake	4.7	Ob.	Perm.	None
18.	Atwood Fish Farm Lake	0.5	Ob.	Perm.	None
19.	Atwood Fish Farm Lake	0.4	Ob.	Perm.	None
20.	Atwood Fish Farm Lake	0.4	Ob.	Perm.	None
21.	Atwood Fish Farm Lake	0.2	Ob.	Perm.	None
22.	Brown's Quarry	4.0	Ov.	Fee	None
23.	Bill Howard Lakes	21.1	Ob.	Perm.	None
24.	Bill Howard Lakes	5.0	Ob.	Perm.	None
25.	Bill Howard Lakes	2.6	Ob.	Perm.	None
26.	Bill Howard Lakes	2.5	Ob.	Perm.	None
27.	Bill Howard Lakes	1.8	Ob.	Perm.	None
28.	Bill Howard Lakes	1.4	Ob.	Perm.	None
29.	Lake Leanna	4.8	Ro.	None	60%
30.	Lake Manoa	20.0	Rt.	None	30%
31.	Lake Summerset	283.0	Ob.	None	5%
32.	Larson South Pit	11.0	Ob.	Perm.	None
33.	Spring Estates Lake	12.0	Ob.	None	80%
34.	Whelan's Quarry	2.6	Rt.	Fee	None
35.	Tall Oaks Subdivision Lake	2.1	Ob.	Perm.	30%
		388.1 Total No. 22			
		PRIVATE			
36.	Horseshoe Lake	10.0	Ob.	Perm.	None
37.	Glen Swartz Lake	17.0	Ob.	Perm.	None
		27.0 Total No. 2			

TABLE 9 continued

Name	Size	Shape	Public Access	Approx. % of Shoreline Development
	FEE			
38. Lilja's	2.3	Ov.	Fee	None
39. Lilja's	1.0	Ov.	Fee	None
40. Pearl Lake	30.6	Rt.	Fee	None
41. Windsor Lake	38.5	Ob.	Fee	50%
	72.4	Total No. 4		

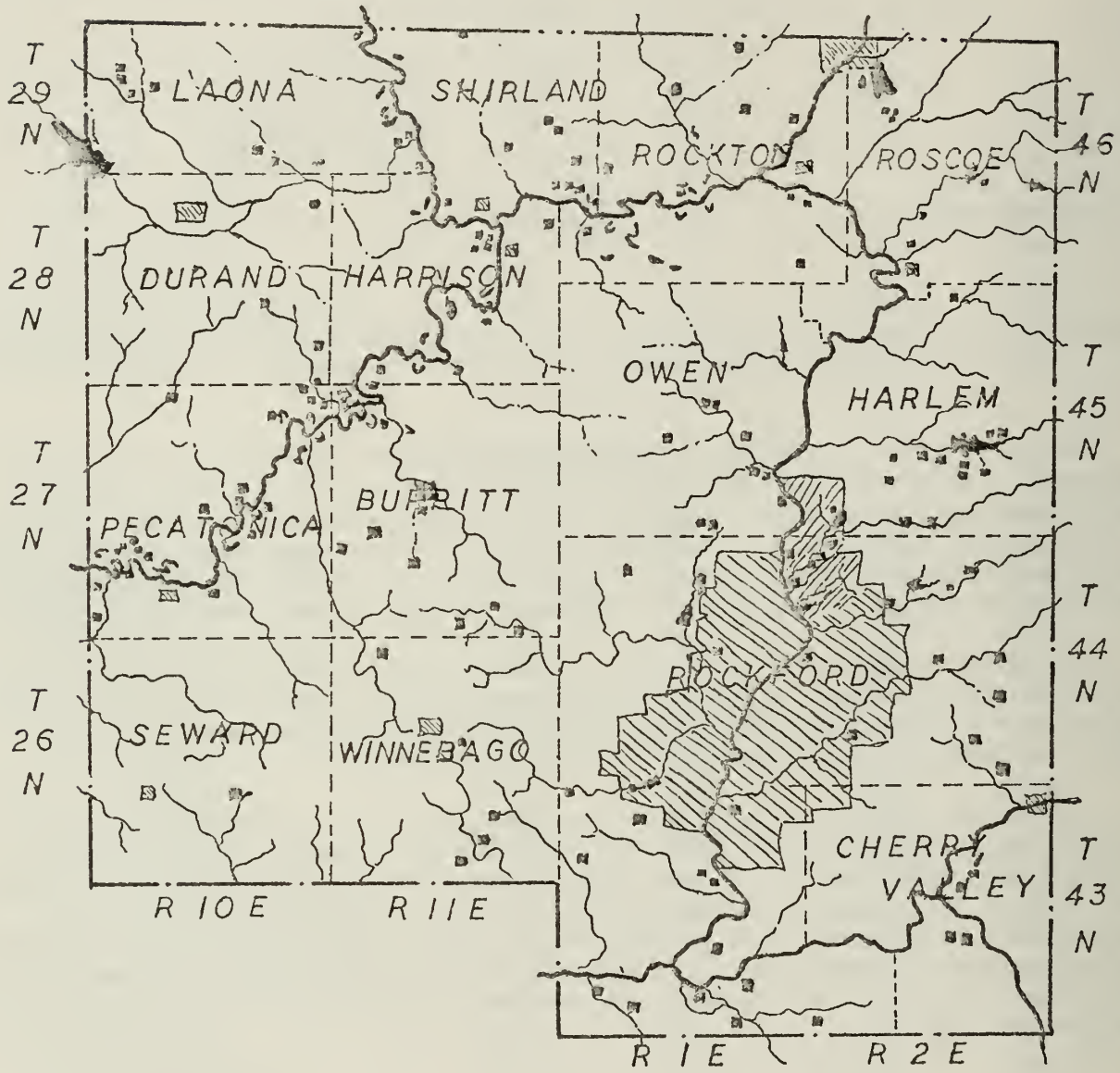
Legend: Ro. - Round, Rt. - Rectangular, Ob. - Oblong, Ov. Oval, Perm. - Permission Required, Fee - Either required to fish or membership in club.

Table 9, gives a breakdown of the county's major impoundments on the basis of ownership. As can be seen from this table, only three of the impoundments are under Department ownership with all of them located at Rock Cut State Park. Another eleven impoundments are owned by various agencies throughout the county but these contain a total of only 67.1 acres of water. Few of these impoundments are sizeable enough to accommodate fishing and none can accommodate boating.

The largest total for the county is organizational with 22 bodies of water inundating 338.1 acres. A few of these organization's waters are open to the public on a permission basis; however, most of them require membership in a club or a lake association before access is granted.

Under the heading of private water areas, we find only two lakes; however, to this total could be added over 100 other bodies of water which are also privately owned but are not listed here. Many of these private ponds can offer good fishing but require permission before access is granted. Of the four impoundments listed under the heading of fee, two of them are managed primarily for swimming with fishing being secondary. As has been stated previously, the Lilja Fee Ponds in Leona township are destined to be incorporated into the Lake Summerset complex.

FIGURE 8.
IMPOUNDMENT DISTRIBUTION IN WINNEBAGO COUNTY



LEGEND:

POND =

OXBOW =

LAKE =

TABLE 10

Impoundment Location and Acreage in Winnebago County by Township as of January 1, 1970

Township	Ponds		Lakes		Grand Total	
	No.	Acres	No.	Acres	No.	Acres
Burritt	13	27.6	3	29.2	16	56.8
Cherry Valley	5	6.1			5	6.1
Durand	3	3.3			3	3.3
Harlem	10	5.8	2	200.5	12	206.3
Harrison	13	25.2	4	35.2	19	60.4
Laona	15	18.4	2	298.0	17	316.4
Owen	13	15.2			13	15.2
Pecatonica	24	57.6	2	36.1	26	93.7
Rockford	25	39.0	4	49.0	29	88.0
Rockton	15	23.9	6	59.0	21	82.9
Roscoe	9	17.1	2	47.1	11	64.2
Seward	1	1.1			1	1.1
Shirland	9	6.9	1	7.0	10	13.9
Winnebago	5	10.2			5	10.2
Totals for County	160	257.4	26	761.1	186	1,018.5

Table 10 was prepared from information measured off of A. S. C. S. aerial photos for the Illinois Division of Fisheries' 1964 publication, "Illinois Surface Water Inventory" (Lopinot 1964). This 1964 information was brought up to date for this publication and data on the ponds and lake totaled on a township basis. From Table 10, we see that Rockford Township has the most ponds with 25 and Pecatonica follows a close second with 24. The two townships are reversed on the basis of total acreage of ponds with Pecatonica leading the way with 57.6 acres and Rockford Township second with 39.0 acres. Rockton Township has the most lakes with six, and Harrison and Rockford townships are tied for second with four. Laona Township has the highest acreage in lakes with a total of 298 acres, a distinction only recently gained following the construction of Lake Summerset in 1969. Laona has also captured first place for total acreage of impoundments with 316.4 acres. Rockford Township again heads the list with a total of 29 impoundments.

Figure 8 is a map of the county on which all impoundments have been plotted. As can be seen from this map, these impoundments are scattered throughout the area but are primarily clustered along the floodplains of the various streams. An oddity which has occurred is the almost complete lack of pond development in both Seward and Winnebago townships. Since soil types are not that poor in these areas, other factors must be responsible for this lack of construction.

TABLE 11

Summary of Pond and Lake Construction in Winnebago County

Since January 1, 1963

Chronology Totals	Ponds		Lakes		Grand Totals	
	No.	Acres	No.	Acres	No.	Acres
as of Dec. 31, 1962	136	219.2	22	447.6	158.0	668.8
Construction 1963-1965	10	13.6	2	21.0	12	34.6
Construction 1966-1969	14	24.6	2	290.5	16	315.1
Totals as of January 1, 1970	160	257.4	26	761.1	186.0	1,018.5

Table 11 shows the construction of ponds and lakes since 1962. From this data can be seen that only four new lake size impoundments have been constructed in the past seven years and 24 new ponds. The only impoundment of any size was Lake Summerset (283 acres). Winnebago and Boone counties have both failed to keep pace in pond development with their neighbors to the east. For example, McHenry County has built over 125 ponds during the same period and in 1969, Lake County built over 50 ponds. There are two factors which help to explain this lack of impoundment development in Winnebago County, one is the relative lack of proper soil types for pond development, due to the extensive gravel deposits along the valley trains. Secondly, Winnebago County has not become as "estatized" as many of its eastern neighbors.

Potential Reservoirs

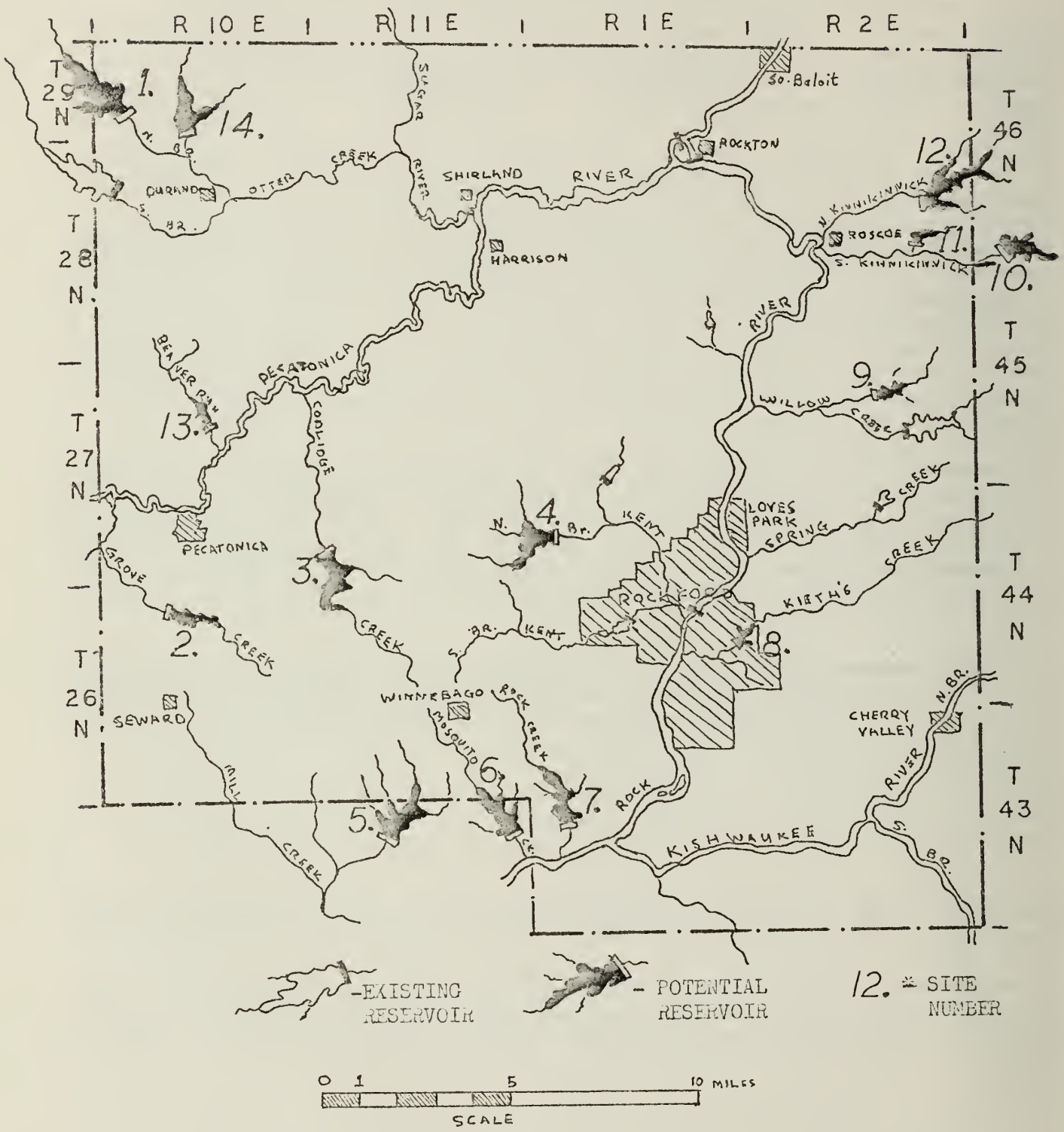
In the spring of 1967, the Illinois State Water Survey published a report which described the possible locations for 115 surface water reservoirs in 23 northern Illinois counties. This report reveals the possible location of eight reservoirs in and bordering Winnebago County. Figure 9 shows the locations of these eight sites and an additional seven sites which have come to light since the 1967 publication. Appendix No. 5 contains physical data on these sites. Detailed summaries of the water survey's feasibility studies for each of their sites are contained in the above mentioned report and therefore will not be duplicated here.

Of the 14 sites, number 12 is the largest having a possible size of 486 acres; this site is considered feasible subject to verification by a series of test borings. Due to its large size and bi-county nature, this site offers an excellent opportunity for inter-county cooperation between the Boone County Conservation District and the Winnebago County Forest Preserve District. This lake would be a welcome addition to the recreational facilities of both counties. Sites numbers 5, 6 and 10 would have their dams located outside the boundaries of the county; however, sites 5 and 6 would back water into the county. The Forest Preserve District is already considering the sites number 2, 13 and 14. The 237 acre site, number 7 on Rock Creek has been recommended for inclusion in the Rockford Park District's holdings. The 185 acre site number 4, on the North Branch of Kent Creek, has been recommended by the U. S. Army Corps of Engineers for an integral part of their flood control plan for that watershed, and site number 8, in Aldeen Park was constructed in the 1940's but never filled. Site 9 is located on land which the State Conservation Department is contemplating on purchasing as an addition to Rock Cut State Park. Although no engineering studies have been made, a preliminary investigation of the soil types and relief indicates that the development is most likely feasible. Two lakes of around 30 acres a piece would be a most desirable addition to the State's facilities at Rock Cut.

Boise Cascade is in the process of acquiring site number 1 as an addition to its Lake Summerset development. There are undoubtedly other suitable reservoir sites in Winnebago County and recreational planners ought to ask the State Water Survey to reevaluate the present sites and look for new ones prior to submitting their final plans and reports. If all of the presently known sites were to be constructed, 1,979 acres would be added to the county's surface waters. Adding to this, the three sites which lie just over the border, we arrive at a grand total of 2,530 acres of new recreational water areas.

One factor, which in the opinion of the author should be considered by both State and County agencies involved with granting permits or zoning for lake development is the requirement of provisions for public access to all impoundments larger than 150 acres. This should be consummated prior to the beginning of construction. If this type of action had been taken in previous years, Lake Summerset and many other large recreational lakes built or subdivided in Illinois would be in better condition and better utilized today from a fisheries standpoint.

FIGURE 9.
POTENTIAL RESERVIOR SITES IN WINNEBAGO COUNTY



Source Of Data-Illinois State Water Survey, Report of Investigation # 58- Potential Surface Water Reservoirs of Northern Illinois-Dawes and Terstriep-1967

Lake Morphometry and Origin

The surface waters of Winnebago County have had a wide variety of origins, ranging from quarry and gravel pits developed as a result of mining operations to the formation of slough potholes and oxbow lakes by the direct action of the elements.

TABLE 12

A SUMMARY OF ALL IMPOUNDMENTS IN WINNEBAGO COUNTY BY ORIGIN AS OF JANUARY 1, 1970

ORIGIN	NUMBER	ACREAGE	
Artificial Impoundment	99	601.4	(59.1%)
Oxbow Lake	51	269.5	(26.4%)
Gravel Pit	19	110.0	(11.0%)
Slough Pothole	12	23.3	(2.2%)
Borrow Pit	3	7.7	(0.8%)
Rock Quarry	2	6.6	(0.6%)
Total Waters	186	1,018.5	

Table 12 summarizes Winnebago County's 186 impoundments according to their origin. While there are quite a few quarries scattered throughout the county, only two are known to contain water. The largest is the 4.0 acre Brown's Quarry, which lies just west of the Rock River North of Loves Park. The other quarry is the 2.4 acre Whelen's Quarry near Winnebago. Together they account for 0.6 percent of the county's impoundments.

Borrow pits developed as a result of highway construction are found only along interstate 90. There are three, the largest of which is 6.0 acres. They contain 0.8% of the impounded water.

Twelve slough potholes are scattered throughout the county's marshland, containing a total of 2.2% of the impounded water. Most of these areas are found along the Kishwaukee, Sugar and Pecatonica rivers, and few exceed one acre in size.

Many gravel mining excavations occur along the Rock River Valley in Winnebago County, of them 19 are known to contain water, the largest being the 38.5 acre Windsor Lake in Loves Park. Pearl Lake runs a close second, impounding a total of 30.8 acres. These water areas have for years been the site of most impoundment type angling in the county. They represent 11.0 percent of the county's impounded water.

Due to the geologic history of the Pecatonica River Valley, which caused the deposition of a mantle of fine silt, changes in the river's course were greatly facilitated. The erosive potential of running water is well known, and in the Pecatonica Valley during the past 100,000 odd years, the river's

course has changed many times, creating many "oxbow" lakes and ponds. There are 42 of these impoundments along the Pecatonica River, and nine along the Sugar River. These 51 water areas account for 26.4 percent of the impoundments.

The remaining 59.1 percent of Winnebago County's impounded water is contained in the 99 artificial lakes and ponds scattered throughout the county. Most of these areas were developed for recreational purposes.

Of the 25 impoundments mentioned in this report, 11 are oblong in shape; seven are rectangular; five are oval; and one is round. Few water areas exactly fit these descriptions in that their shorelines are for the most part irregular.

Pearl Lake is presently the deepest body of water in the county, having a maximum depth of 85 feet. Adjacent to Pearl Lake is Lake Victoria, which reaches a maximum of 55 feet. Both of these lakes are of gravel pit origin. Most of the farm ponds, potholes, and oxbows have depths which range from two to twelve feet. The Conservation Department requires that the bodies of water which it stocks, be at least 12 feet deep to lessen the chance of the occurrence of winterkill.

Water Quality

Very little data exists relative to the chemical quality of Winnebago County streams. Even less is known of the water quality of its lakes and ponds. Table 13 is a compilation of the pertinent information in relation to the water quality of the county's streams. Several of these streams have been intensively sampled by the Illinois Department of Public Health's Sanitary Engineering Division from 1959 to the present. These streams are the Kishwaukee River, Rock River, Pecatonica River and Kilbuck Creek. In recent years, the State Department of Public Health has begun on a small scale to collect information concerning the relative abundance of various aquatic life forms in the major streams, such as aquatic insects and other bottom fauna. At the present time their staff has been quite limited and so has this work. The recent announcement by the Governor concerning the reorganization of the state pollution control agency will most likely help to intensify these efforts.

Very few lake size impoundments have been sampled chemically for water quality information. The lake which has received the most attention is Pierce State Lake. Some information has also been collected on the Rock Cut East Borrow Pit and at Four Lakes Forest Preserve. Most of the water chemistry data collected by field biologists of the Division of Fisheries has been restricted to pH (hydrogen-ion concentration), temperature, dissolved oxygen determinations, and secchi disc (turbidity) readings taken, during the course of fisheries investigations.

When one classifies water quality, the most singly important parameter is usage. The quality of the water supply whether surface or sub-surface is directly related to the concentration of dissolved minerals, chemicals and organic substances which it contains. These concentrations are usually expressed in parts per million, parts of water and are graded as to quality in relation to a given usage such as industrial, home consumption, body contact, etc. As is the case with most of Illinois, Winnebago County's surface water can be classed as highly fertile, hard and productive. Boyle (1949) states that surface water with a total methyl-orange alkalinity reading above 90 p.p.m. is very high relative to fish food and plant productivity. If this is the case, then it can be said the waters of Winnebago County are extremely fertile, as alkalinity readings for the Rock River and its tributary streams (Table 13) averages 239 p.p.m.

Alkalinity tests taken in February of 1968 on Pierce Lake gave a reading of 204 p.p.m. Eleven alkalinity tests run between March 25 and August 30, 1968 on Rock Cut East Borrow pit showed that this water area had an average seasonal reading of 281 p.p.m. A test run in August of 1967, in the Four Lakes Forest Preserve ponds gave a reading of 182 p.p.m., and a test in Pearl Lake in July, 1968, read 171 p.p.m. Although this is scant information, it leads one to generalize that the county's impoundments tend to parallel that of the streams with gravel, borrow pits and quarries averaging somewhat higher than other impoundments.

Measurements of the hydrogen ion concentration in the county's ponds and lakes show that the average pH value is 8.4 (from 7.8 to 8.6), on a scale where 7.0 is neutral or soft. The average pH in the Rock Cut Borrow Pit was 8.1, slightly lower than that found for watershed impoundments. The pH values for Winnebago County's streams, based on a combination of the public health department readings and those taken by Fisheries' Personnel (Table 13) show that the streams' average is 7.9.

The stream values tend to show much more day to day variation due to the dynamics of flow. Impounded water is much more stable and under normal conditions, its chemical constituents more readily precipitate out of solution when excess are added.

Turbidity is an important factor influencing the productivity of our surface waters but in a manner different from water chemistry. Game fish must be able to find food items by sight, therefore high turbidity (secchi disc visability less than 8.0 inches) greatly limits their food gathering power.

Impoundment turbidity in the county may vary from six inches in Levings Lake which has a high density population of bottom feeders to 120 inches in Lake Victoria and Pearl Lake, both of which are quite deep and fairly infertile with hard bottoms and little silt.

Our samplings have shown that stream turbidities can vary widely (Table 13) from six inches during times of high runoff, following precipitation to a complete lack of turbidity (clear to bottom) during times of normal flow.

The primary factors influencing these variations in turbidity are erosion caused siltation, high densities of bottom feeding fishes, plankton blooms caused by excessive fertility, and wave action. In most instances most or all of these factors interplay to create the condition.

Variations in land use and farming customs directly influence the amount of siltation. From data presented in Table 13, we see the North Branch of Kent Creek is usually clear to the bottom while the South Branch is always very turbid. There is much more row cropping done in the drainage of the South Branch with permanent pasture predominating in the basin of the North Branch. The Pecatonica River, due to the composition of its flood plain, (fine sandy silt) tends to be quite turbid and carries a heavy silt load. In the Rock River both silt and plankton algae blooms cause high turbidities. The Kishwaukee River is also quite turbid at present; however, in years past, it was much clearer.

The phenomenon of turbidity is very important to fisheries' personnel as the health of fish populations in given lakes and streams is directly related to it. If high turbidity persists over long periods, fish such as largemouth bass, smallmouth bass and especially sunfish, such as the bluegill can be greatly influenced and even depressed by the situation.

Due to the lack of both fertility and shallow water most gravel, borrow and quarry pits are poor producers of fish. Most often fish production in these areas far exceeds the food supply and stunting occurs. The lack of oxygen in the cold, deep water of Winnebago County impoundments renders most of them unadaptable to such species as trout and walleye.

In bodies of water having a low turbidity, aquatic vegetation can become quite profuse and in many occasions cause water use problems. Historically, anglers felt that large quantities of vegetation were required to produce desirable fish populations. Research has however disapproved this idea. Small beds of aquatic vegetation tend to be beneficial in that they provide home for aquatic insects and other fish food organisms; thereby concentrating fish in these areas. When these beds become dense, they provide excessive shelter and therefore excessive survival of panfish. Appendix No. 6 is a listing of the 25 species of aquatic plants presently known to occur in Winnebago County water areas.

TABLE 13

PHYSICAL AND CHEMICAL CHARACTERISTICS OF THIRTY WINNEBAGO COUNTY, NAMED STREAMS

Streams Names	Surface Acres Water	Approx. Drainage Area (Acres)	Length (Miles)	Ave. Width (Feet)	Flow F/S	Predominant Bottom Type	Turbidity (Inches)	M.O.A. (ppm)	pH	Pollution (Degree)	Angler Usage
Beaver Run	0.6	1,196.4	3.5	2.0	ND	Silt & Sand	CL	ND	ND	N	N
Blacks Creek	0.7	5,248.0	5.1	8.0	0.5	Gravel	24"	ND	8.2	LT	LT
Canal Creek	6.3	3,072.0	3.5	15.0	0.5	Gravel	8"	ND	8.2	LT	LT
Coolidge Creek	5.3	10,880.0	9.5	8.0	0.2	Sand	15"	ND	7.8	N	N
Dry Creek	8.3	8,550.0	11.3	6.0	0.8	Gravel	28"	ND	8.0	LT	N
Fuller's Creek	1.3	3,040.0	4.5	2.5	ND	Gravel	ND	ND	ND	LT	N
Grove Creek	19.1	8,512.0	8.3	18.0	0.8	Rubble	24"	ND	8.2	N	LT
Loves Park Drain	2.5	4,672.0	5.0	4.0	0.2	Gravel	CL	ND	7.8	LT	N
Keith's Creek	1.5	7,040.0	8.9	1.5	0.2	Silt	6"	ND	8.0	N	N
N. Br. Kent Creek	8.3	20,800.0	10.7	13.0	0.6	Rubble	CL	ND	7.8	LT	H
S. Br. Kent Creek	7.2	6,208.0	7.2	8.0	0.3	Silt	6"	ND	8.2	LT	N
Kilbuck Creek	42.4	5,888.0	5.0	70.0	2.0	Rubble	17"	238	8.0	LT	H
N. Kinnikinnick Creek	15.8	3,280.0	6.5	20.0	0.3	Silt	14"	ND	7.8	LT	LT
S. Kinnikinnick Creek	5.5	3,584.0	4.5	10.0	0.7	Gravel	CL	ND	7.8	N	LT
Kishwaukee River	303.2	30,800.0	20.0	125.0	1.2	Silt	7"	246	8.2	M	H
McDonald Creek	1.2	5,120.0	8.1	5.0	0.3	Gravel	8"	ND	8.2	N	N
Mill Creek	4.9	12,928.0	10.3	15.0	0.5	Gravel	11.0"	ND	7.8	N	LT
Mosquito Creek	1.7	3,200.0	3.6	4.0	0.7	Silt	10"	ND	7.8	N	N
Mud Creek	1.8	4,288.0	4.1	13.0	0.3	Silt	13"	ND	7.8	LT	LT
Otter Creek	28.1	19,840.0	19.3	12.0	1.1	Silt	15"	ND	8.0	LT	M
Pecatonica River	640.0	61,040.0	34.0	156.0	1.4	Sand & Silt	13"	246	7.3	M	H
Pink Creek	5.5	6,720.0	9.0	5.0	0.6	Silt	12"	ND	7.8	N	N
Raccoon Creek	16.0	9,960.0	6.6	20.0	0.9	Silt	35"	ND	8.2	LT	M
Rock Creek	7.0	5,631.0	6.2	10.0	0.8	Gravel	18"	ND	7.9	N	LT
Rock River	1,642.5	43,562.0	33.6	403.0	2.2	Gravel	15"	235	8.2	M	H
Spring Creek	1.7	3,968.0	7.6	2.0	0.6	Gravel	CL	ND	7.8	LT	N
Sugar River	313.0	17,280.0	9.1	92.0	2.2	Sand	16"	ND	7.9	LT	H
Sumner Creek	5.5	6,080.0	6.0	1.5	0.7	Silt	10"	ND	8.2	N.	LT
Turtle Creek	12.7	1,260.0	2.1	50.0	1.5	Rubble	CL	ND	7.8	LT	M
Willow Creek	9.9	9,152.0	8.2	8.0	0.6	Gravel	CL	230	8.1	LT	LT
TOTALS FOR COUNTY	3,116.5	332,800.4	281.3				Avg.	239	7.9		

LEGEND: CL-Clear to bottom; ND-Data Not Available; N-None; LT-Light; M-Moderate; H-Heavy; M.O.A.-Methyl Orange Alkalinity; I.D.C.-Special Fisheries Reports #3 and #13 (1963-1965); Div. Fisheries District Files, Illinois State Sanitary Water Board Report, Water Quality Network, Part #3 (1966).

FISHERIES

Winnebago County due to its recent past which was predominated by the Illinoisan glaciation is not richly endowed with natural bodies of water like its neighbors to the north and east. The 51 natural oxbows which occur along the Pecatonica and Sugar rivers are of post-glacial development due to stream meandering. The slough potholes, 12 of which occur in the county, could possibly be remnants of glacial lakes which have since filled in. Of the county's 25 most important impoundments, 90 percent are completely artificial and the rest are of oxbow origin. Most of the county's pond size impoundments have been stocked with, and are managed "to produce largemouth bass and bluegill". Twenty-nine species of fish are known to occur in the major impoundments. The frequency of occurrence of most of these species is shown in Figure 10. Based on this information, largemouth bass and bluegill are the county's and perhaps, the state's most important sport fish since they occur in 16 and 15 of the county's major impoundments respectively, and in most all of the artificial ponds. Other impoundment species which rank in the top ten in order of occurrence are: green sunfish, black bullhead, black crappie, northern pike, white crappie, channel cat, carp and white sucker.

Brown trout have been stocked in several of the county's gravel pits, most notably Lake Victoria and Pearl Lake. Rainbow trout have been stocked in quite a few of the county's ponds and also occur in both the previously mentioned gravel pits. Brown and rainbow trout also occur in several of the county's streams; these are the North Branch of Kent Creek, Mill Creek (primarily in Ogle County) and are occasionally taken in the Rock River. As has been discussed earlier, for many years the state has stocked Kent Creek in the area of Anna Page City Park, with rainbow and brown trout in varying numbers. This creek, while not a trout water, does have considerable spring activity and can maintain trout during all seasons except summer at present. During July and August, surface temperature except in the deeper pools exceeds 70° and severely limits the trout holding capacity for the area. Should the proposed Corp of Engineers' flood control reservoir be constructed upstream from the park, the trout holding capacity of the stream could be possibly enhanced by equipping the control structure to discharge water syphoned from below the 15 foot contour. At present, the state's trout stocking program is dependent on the Federal Hatcheries production of these species.

The major impoundments of Winnebago County can be subjectively classified into four distinct production types: 1) largemouth bass - panfish; 2) northern pike - bass pnafish; 3) carp - bullhead - panfish; 4) trout - panfish. Numerically, the breakdown is as follows: Type 1 = 9 water areas; Type 2 = 4 water areas; Type 3 = 8 water areas; Type 4 = 4 water areas. In Figure 11, this classification is superimposed on a map of the county.

Pierce State Lake, which is a member of Type 1, probably receives more fishing pressure than the rest of the impoundments combined. Fishermen Creel Census, which were run in 1964-65, showed that there were 51,917 and 38,710 angler trips made to the lake during those years respectively. These anglers spent 132,965 hours in 1964 and 102,819 hours in 1965 in pursuit of their sport. No creel data is available for any of the other impoundments in the county. However, a study such as this will be run in 1970, at Four Lakes Forest Preserve to determine angler utilization of that area. Levings Park Lake and Martin Park Lagoon each receives their share of anglers; however, most of these are children. Once Lake Summerset fills and the homeowners start to use it, fishing

FIGURE # 10
FREQUENCY OF OCCURENCE OF 34 FISH SPECIES
IN WINNEBAGO COUNTY LAKES AND STREAMS

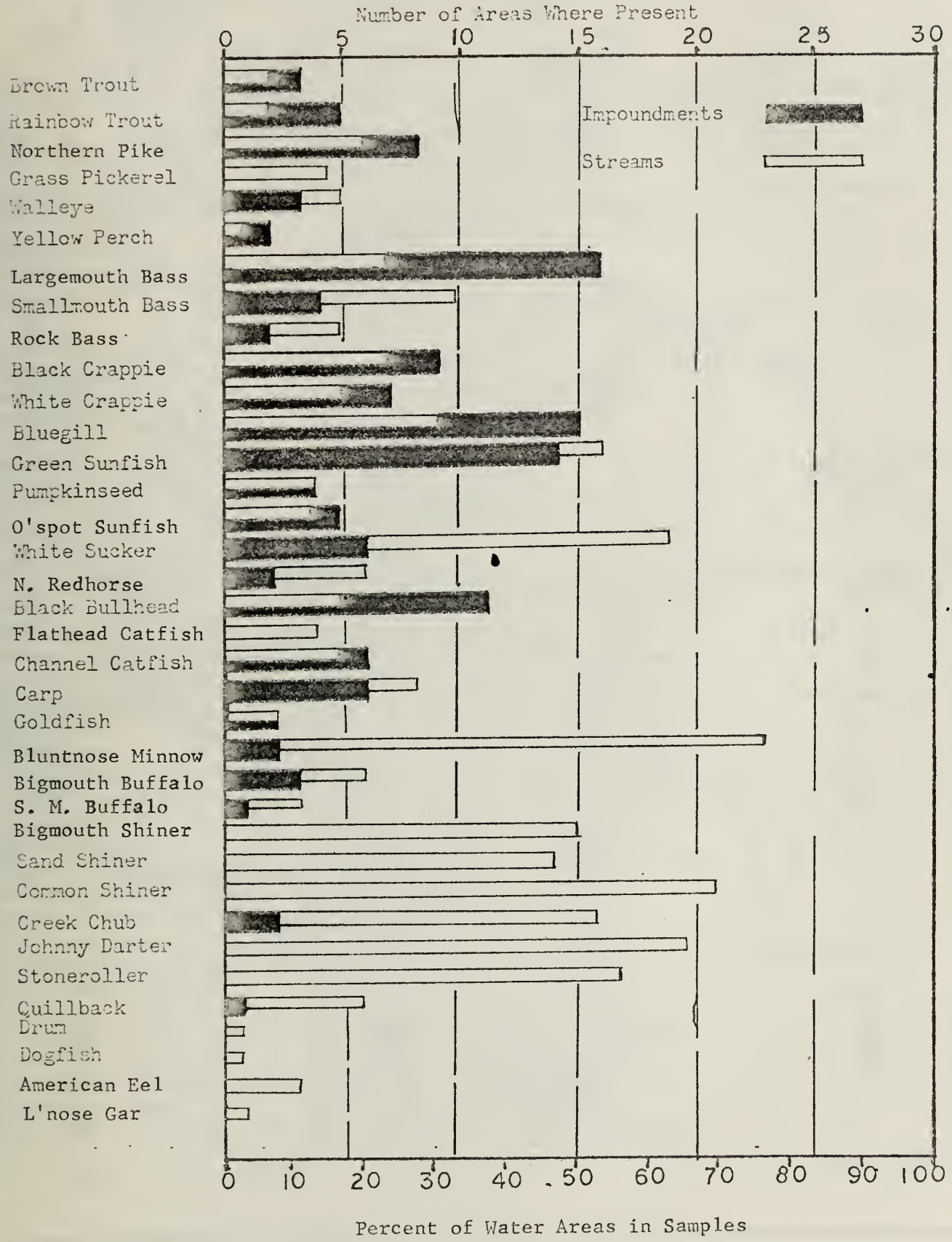


Figure 11 - Fisheries Resources

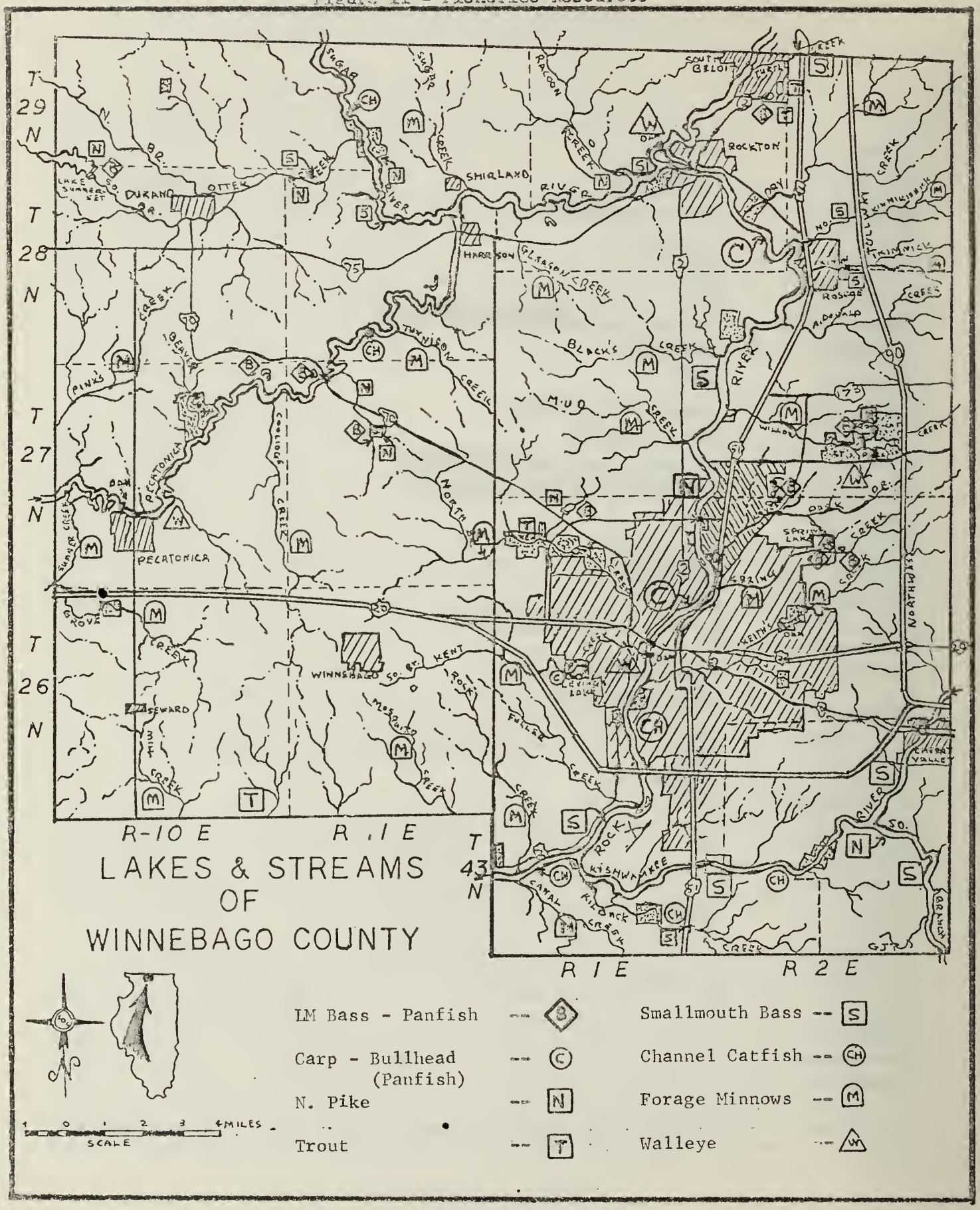


TABLE 14

A List Of Fish Species Known To Occur In The Lakes And Streams Of Winnebago County

Common Name	Scientific Name & Family*	Major Impoundments	Named Streams
	Petromyzonidae-Lampreys		
Brook Lamprey	Lampetra lamottei-(Lesueur)	1	5
	Lepisosteidae-Gars		
Longnose Gar	Lepisosteus osseus (Linnaeus)	0	1
	Amiidae-Bowfins		
Dogfish	Amia calva Linnaeus	0	1
	Anguillidae-Eels		
American Eel	Anguilla rostrata (Lesueur)	0	3
	Salmonidae-Trouts		
Brown Trout	Salmo trutta Linnaeus	2	3
Rainbow Trout	Salmo gairdneri Richerdson	5	2
	Umbridae-Mudminnows		
Central Mudminnow	Umbra limi (Kirtland)	1	2
	Esocidae-Pikes		
Northern Pike	Esox lucius Linnaeus	8	6
Grass Pickerel	Esox americanus vermiculatus-Lesuer	0	4
	Cyprinidae-Minnows & Carps		
Stonerollers	Campostoma animalum (Raninesque)	0	17
Goldfish	Carassius auratus (Linnaeus)	2	2
So. Redbelly Dace	Chrosomus erythroguster (Ruffinesque)	0	12
Carp	Cyprinus carpio Linnaeus	6	8
Ozark Minnow	Dionda nubila (Forbes)	0	3
Brassy Minnow	Hybognathus hankinson Hubbs	0	1
W. Silvery Minnow	Hybognathus nuchalis Agassiz	0	1
Horneyhead Chub	Hybopsis biguttata (Kirtland)	0	13
Silver Chub	Hybopsis storeriana (Kirtland)	0	1
Gravel Chub	Hybopsis X-punctata Hubbs & Crow	0	1
Golden Shiner	Notemigonus crysoleucas (Mitchill)	0	2
Emerald Shiner	Notropis atherinoides Rafinesque	0	3
Common Shiner	Notropis cornutus (Mitchill)	0	21
Bigmouth Shiner	Notropis dorsalis (Agassiz)	0	15
Spottail Shiner	Notropis hudsonius (Clinton)	0	1
Rosyface Shiner	Notropis rubellus (Agassiz)	0	4
Spotfin Shiner	Notropis spilopterus (Cope)	0	10
N.E. Sand Shiner	Notropis stramineus (Cope)	0	14
Weed Shiner	Notropis texanus (Girard)	0	1
Redfin Shiner	Notropis umbratilis (Girard)	0	6
Suckermouth Minnow	Phenacobius mirabilis (Girard)	0	6
Bluntnose Minnow	Pimephales notatas (Rafinesque)	0	3
N. Fathead Minnow	Pimephales promelas Rafinesque	0	11
N. Bullhead Minnow	Pimephales vigilax (Girard)	0	1
W. Blacknose Dace	Rhinichthys atratulus Agassiz	0	7
Creek Chub	Semotilus atromaculatus (Mitchel)	2	16

Common Name	Scientific Name & Family*	Major Impoundments	Named Streams
	Catostomidae-Suckers		
N. River Carpsucker	Carpiodes carpio (Rafinesque)	1	3
Quillback Carpsucker	Carpiodes cyprinus (Lesueur)	1	6
White Sucker	Catastomus commersoni (Lacepede)	6	19
N. Hog Sucker	Hypentelium nigricans (Lesueur)	0	7
Smallmouth Buffalo	Ictiobus bubalus (Rafinesque)	0	2
Bigmouth Buffalo	Ictiobus cyprinellus (Valenciennes)	3	6
Silver Redhorse	Moxostoma anisurm (Rafinesque)	0	2
Golden Redhorse	Moxostoma erythrurum (Rafinesque)	0	5
Northern Redhorse	Moxostoma macrolepidotum (Lesueur)	2	6
	Ictaluridae-Catfishes & Bullheads		
Black Bullhead	Ictalarus melas (Rafinesque)	11	5
Yellow Bullhead	Ictalurus natalis (Lesueur)	0	1
Brown Bullhead	Ictalurus nebulosus (Lesueur)	0	2
Channel Catfish	Ictalurus punctatus (Rafinesque)	6	5
Slender Madtom	Noturus exilis Nelson	0	1
Stonecat	Noturus flavas Rafinesque	0	2
Tadpole Madtom	Noturus gyrinus (Mitchill)	0	1
Flathead Catfish	Pylodicitis olivaris (Rafinesque)	0	4
	Cyprinodontidae-Topminnows		
N. Starhead Minnows	Fundulus notti (Agassiz)	0	1
Blackstripe Topminnow	Fundulus notatus (Rafinesque)	0	1
	Atherinidae-Silversides		
Brook Silversides	Labidesthes sicculus (Cope)	0	1
	Gasterosteidae-Sticklebacks		
Brook Stickleback	Culaea inconstans (Kirtland)	0	4
	Serranidae-Sea Basses		
White Bass	Roccus chrysops (Rafinesque)	0	1
Yellow Bass	Roccus mississippiensis (Jordan & Engenmann)	1	1
	Centrarchidae-Sunfishes		
N. Rock Bass	Ambloplites rupestris (Rafinesque)	2	5
Warmouth Bass	Chaenobryttus gulosus (Cuvier)	1	1
Green Sunfish	Lepomis cyanellus Rafinesque	14	16
Pumpkinseed	Lepomis gibbosus (Linnaeus)	4	4
Orangespotted Sunfish	Lepomis humilis (Girard)	4	5
N. Bluegill	Lepomis macrochirus Rafinesque	15	9
Redear Sunfish	Lepomis microlophus (Gunther)	1	0
Smallmouth Bass	Micropterus dolomieui Lacepede	4	10
N. Largemouth Bass	Micropterus salmoides (Lacepede)	16	7
White Crappie	Pomoxis annularis Rafinesque	7	5
Black Crappie	Pomoxis nigromaculatus (Lesueur)	9	7
	Percidae-Perches & Darters		
W. Sand Darter	Ammocrypta clara Jordan & Meek	0	1
Rainbow Darter	Etheostoma caeruleum-Storer	0	4
Iowa Darter	Etheostoma exile (Girard)	0	1
Fantail Darter	Etheostoma flabellare Rafinesque	0	9
Least Darter	Etheostoma microperch Jordan & Gilbert	0	1
Johnny Darter	Etheostoma nigrum Rafinesque	0	20
Banded Darter	Etheostoma zonale (Cope)	0	1

Common Name	Scientific Name & Family	Major Impoundments	Named Streams
Yellow Perch	Perca flavescens (Mitchill)	2	1
Logperch	Percina caprodes (Rafinesque)	0	1
Blacksided Darter	Percina maculata (Girard)	0	1
Slenderheaded Darter	Percina phoxocephala (Nelson)	0	1
Yellow Walleye	Stizostedion vitreum (Mitchill)	3	5
	Sciaenidae-Sheepheads & Drums		
Freshwater Drum	Aplodinotus grunniens Rafinesque	0	1
	Cottidae-Sculpins		
Mottled Sculpin	Cottus bairdi-Girard	0	1
TOTALS FOR COUNTY	83 Species	25	30

* - Bailey, R., et al. 1960. A List of Common and Scientific Names Of Fishes From The U. S. and Canada, American Fisheries Society, Special Publication #2.

* - Smith, Philip W., et al. 1965. A Preliminary Annutated List Of Lampreys And Fishes Of Illinois, Illinois Department of Registration and Education, Illinois Natural History Survey, Biological Notes #54.

pressure should be maintained at quite a high level. Gravel pit owners for the most part try to discourage fishing as a safety precaution due to the steepness and unstable character of the banks.

Most of the lakes and streams in Illinois are designated as fish preserves or restricted waters, upon which commercial fishing is not allowed. The major areas of commercial fishing activity in Illinois are the Mississippi, Illinois, Wabash and Ohio River systems and Lake Michigan. Each year, a small number of commercial fishing contracts are issued by the Department of Conservation to commercial fishermen desiring to harvest such species as carp, buffalo, and suckers in "restricted water areas". In Winnebago County, one of these contracts is issued for the Rock and Pecatonica rivers. This activity will be reported on in a later section. Sport fishermen are allowed to fish with bank poles or one 50 hook trotline. While trotlines are allowed on the Kishwaukee, Rock and Pecatonica rivers, the latter receives the brunt of this activity. Some clamming is done for bait, however, this activity is quite limited.

During the summers of 1963 and 1965, the Department of Conservation, fisheries' personnel, conducted watershed surveys on the Pecatonica, Sugar, Rock and Kishwaukee rivers. These surveys included sampling stations on the above mentioned rivers, Dry, North Kinnikinnick, Keith's and Kilbuck Creeks. To complete the coverage of the county, the author made seine haul collections in November of 1968 on 22 other streams in the county. All of these collections were submitted to the Illinois Natural History Survey faunistic section for identification. In all, a total of 44 collections from separate sites are on file in Urbana. From these collections, 84 species of fish are known to occur in the county (Table 14).

Based on the number of streams in which they occur, the top ten species are bluntnose minnows, common shiner, johnny darter, white sucker, stoneroller, green sunfish, creek chub, bigmouth shiner, sand shiner and horneyhead chub. Important to the fishery but not so widespread are channel catfish, smallmouth bass, northern pike, walleye, crappies and flathead catfish.

If an attempt to classify the county's streams by production type was made, most of them would fall in the category of producing forage minnows. Smallmouth bass seem to be most abundant in the Kishwaukee system, including Kilbuck Creek. Channel catfish are important to the fisheries of the Rock, Kishwaukee, Sugar and Pecatonica rivers; however, they seem to be most abundant in the Pecatonica River. This is also true of the flathead catfish. Northern pike cannot be considered abundant in any of the county's streams; however their population seems to maintain a higher level in the Sugar River and Otter Creek than any other streams in the county. The Rock River seems to contain the most walleye; although, at the present time, their population is at a low ebb as there has not been a really good spawn since the record one which occurred in 1959 (Rock - 1969).

In terms of access and angler utilization, the Rock River would have to be rated the top stream in the county followed by the Pecatonica.

Representatives of 16 fish families are found in the county. Perhaps, the most primitive of these is the brook lamprey, a non-parasitic member of the lamprey family, which is known to occur in five of the county's streams.

The abundance of the American eel is not well known; however, specimens have been found in Rock, Pecatonica and Sugar rivers. This is the county's most well traveled fish as adults of the species migrate all the way to the Bahamas to spawn. One of the rarest fish found in the county is the Ozark minnow, known only from the Grove and South Kinnikinnick creeks and the Sugar River. Other rare species of minnows are the spottail and weed shiners and the northern bullhead minnow. The redear sunfish is known only from the Four Lakes Forest Preserve where it was introduced in 1962. This fish of the southeastern region of the United States has been exceedingly hard to establish in northern Illinois. The Four Lakes planting represents one of five known successes in the northern counties. The freshwater drum, the only inland species of a largely marine family, occurs in the Rock River and seems to be most abundant from Blackhawk Park in South Rockford north to Loves Park. The mottled sculpin occurs only in the uppermost reaches of South Kinnikinnick Creek.

WETLAND RESOURCES

There is no known previous appraisal of this resource which can be said to be accurate. Most of the United States Geologic Survey topographical maps predate the early 1950's and therefore some of the marshland shown on them are no longer in existence due to tilling and draining activities. The exact acreage of marshland presently in existence in Winnebago County has yet to be accessed by the Rockford City Planning Commission. Using the antiquated topographical maps, the author has arrived at a figure of roughly 2,600 acres of wetlands.

Table 12, prepared from data contained in the "Illinois Water Inventory" (Lopinot et al. 1964) lists a total of 12 slough potholes inundating a total of 23.3 surface acres. Many of the old oxbows along the Pecatonica and Sugar rivers have filled, becoming marshland.

A generalized wetland map (Figure 12) has been prepared using U.S.G.S. Topological maps. If one examines this map, it becomes readily apparent that most of the county's wetlands are found along the floodplains of the Pecatonica and Sugar rivers. There is also a small quantity of marshland associated with the mouth of Kilbuck Creek and rather large marshy areas in the upper watersheds of Grove, Otter and Raccoon creeks.

The basic soil types which underlay much of the county's wetlands are mixed loam bottom, deep peat and black mixed loam.

Very little of Winnebago County's marshland is presently in public ownership. Since this resource is not great, steps should be taken to preserve the larger tracts in existence and any smaller tracks which contain exotic plants and animals. Such species as northern pike, walleye, muskrat, beavers, waterfowl and shore birds are to a great degree dependent on wetlands for nursery areas and homesites.

FIGURE 12 WETLAND RESOURCES

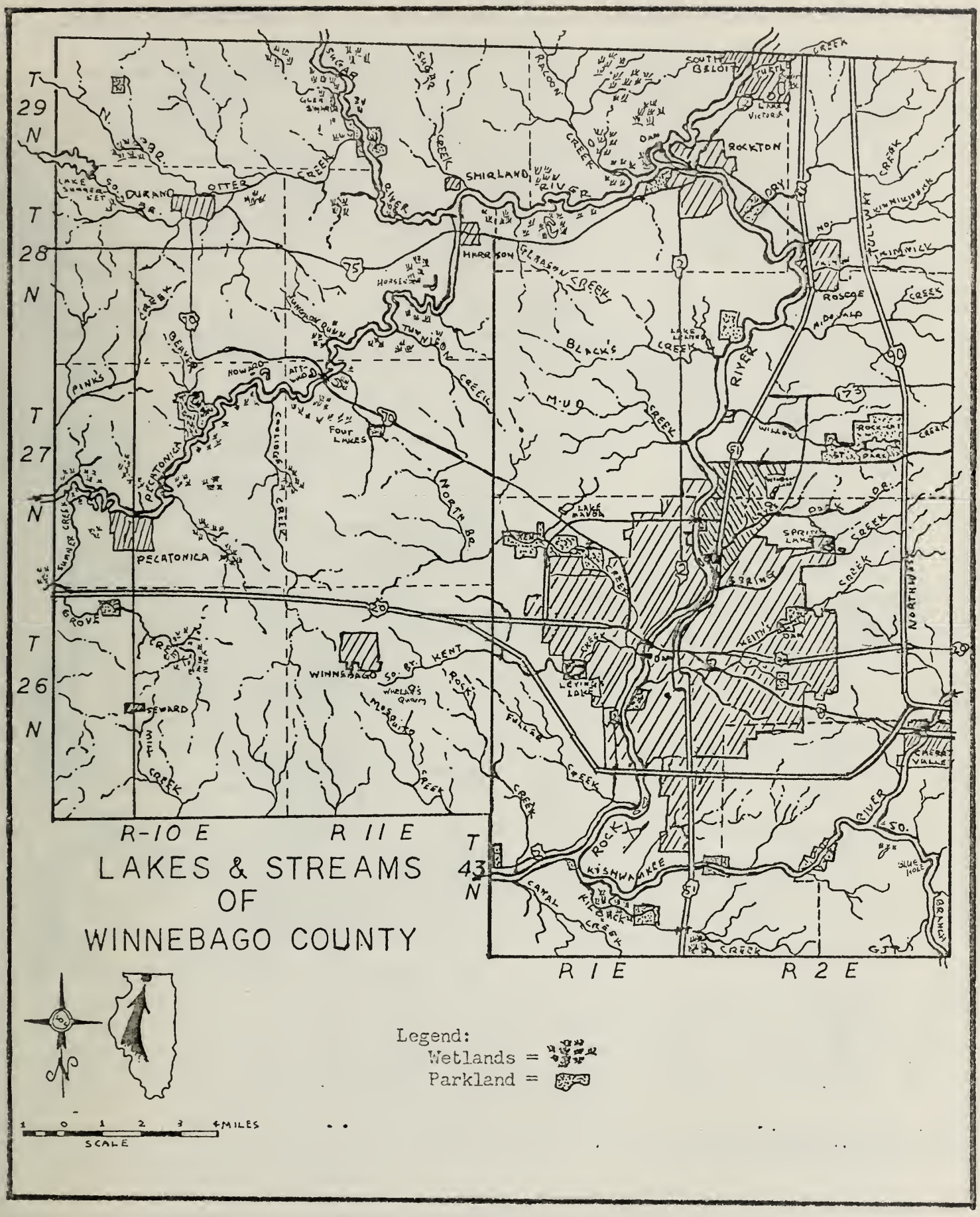
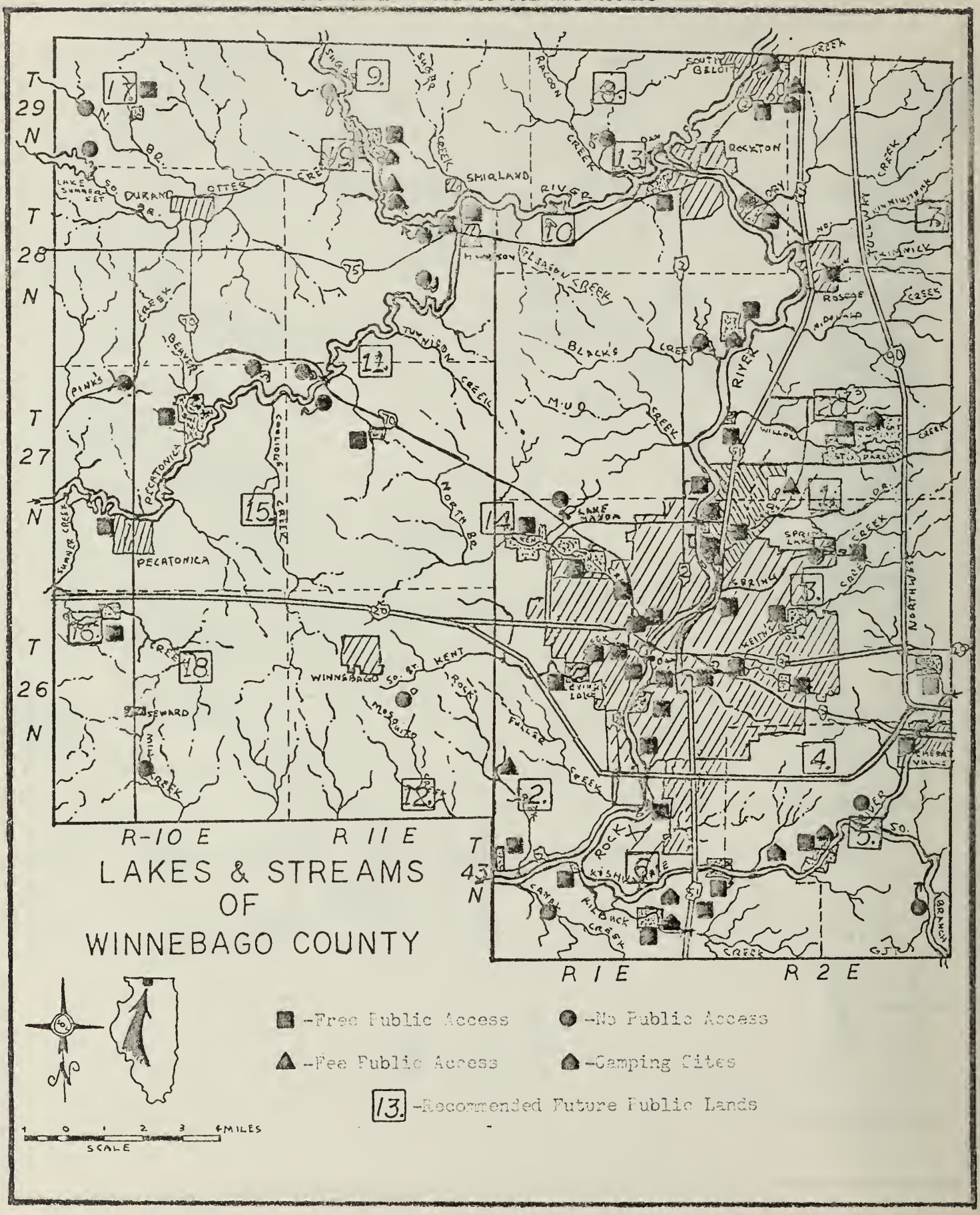


FIGURE 13 - PUBLIC USE AND ACCESS



PUBLIC USE AND ACCESS

Figure 13 was prepared from data contained in the files of the Division of Fisheries and also from information listed in the Rockford City - County Planning Commission's Park and Open Space Study for Winnebago County (De Filippis et al. 1969). On this map, the county's major impoundments and streams are classified by their degree of access to the general public. The categories used were 1) free public access, 13 streams and 5 impoundments; 2) fee public access, 3 streams and 2 impoundments; 3) no public access, 8 streams and 7 impoundments.

As can be seen from Table 15, most of the public land bordering streams are owned by either the Winnebago County Forest Preserve District or the Rockford Park District.

The only state holding in the county on a stream is a strip of land in Harrison Township owned by the State Highway Department along the west bank of the Pecatonica River. The Illinois Department of Conservation presently owns 1,200 acres of land at its Rock Cut State Park, including 26,400 feet along the shore of Pierce Lake and 3,168 feet of Willow Creek. In all, the County Forest Preserve District owns a total of 14 areas, all but three of which border major fishing streams. Their total land holdings at present are 2,098.5 acres. These preserves contain a total of 47,512 feet of river or creek frontage. Included in this total are the shorelines of the Four Lakes Forest Preserve ponds.

The Rockford Park District has 27 properties which border either the Rock River or several smaller streams. The District also owns the complete shoreline of Levings Lake and the basin of a reservoir site in Aldeen Park. Their properties, 1,851 acres of which border nine different water areas, containing a total of 53,072 feet of frontage. They also own another 739.5 acres of park land which has no water frontage bringing their grand total to 2,590.5 acres.

The Sumner Park District owns 59 acres along the Pecatonica River containing 2,640 feet of shoreline near the Village of Pecatonica.

Several other towns and villages in the county have small parks, some of which have stream or impoundment frontage, accounting for another 124 acres including 6,736 feet of shoreline.

To the above can be added the 158 acre Rock Valley Junior College tract which contains 3,696 feet of shoreline on the campus lagoon and Spring Creek. The Rockford Sanitary District owns a total of 2,920 feet along the east bank of Rock River, south of Blackhawk Park. The Greater Rockford Airport authority owns 12,000 feet along the Rock River in the vicinity of Blackhawk Island and another 3,168 feet along the Kishwaukee River, east of New Milford.

As of April, 1970, there was a total of 6,229.3 acres of publicly owned recreational land in Winnebago County including some 30.5 miles of lake and stream shoreline. There are several private camping areas which are open to the public on a fee basis, all of which includes stream frontage. The location of these areas are shown on Figure 13. Certain clubs also own river and creek frontage; however, access is only granted to members.

The county's organizational waters are open only to persons owning land on them or in the adjacent subdivisions; examples of these would be Lake Manoa, Spring Lake and Lake Summerset.

TABLE 15

PUBLIC PARK LAND IN WINNEBAGO COUNTY AS OF 1970

Name	Twp.	Rg.	Sec.	Area Acre	Water Frontage (Feet)	Water Area
			State Conservation Department			
Rock Cut State Park	45N	2E	26	1200	26,400	Pierce Lake
					3,168	Willow Creek
TOTAL STATE HOLDINGS				1200	29,568	
			County Forest Preserve District			
Atwood Homestead	45N	2E	7	338.3	5,200	Rock River
Four Lakes	27N	11E	9	30	5,808	Four Ponds
Fuller Memorial	43N	1E	19	178.7	None	
Hartley Memorial	28N	10E	34	40	None	
Henchcliff Memorial	43N	1E	21	2	500.0	Kishwaukee River
Hononegah	46N	2E	30	145	1,800.0	Rock River
Hononegah					5,280.0	Dry Creek
Kilbuck Bluffs	43N	1E	26	165	2,100.0	Kilbuck Creek
Kishwaukee River	43N	2E	21	145	4,300.0	Kishwaukee River
Leona Heights	29N	10E	32	40	None	
Macktown	46N	1E	23	214	4,500.0	Pecatonica River
Pecatonica River	27N	10E	10	322.5	9,800.0	Pecatonica River
Pecatonica River					2,112.0	Beaver Run
Seward Bluffs	26N	10E	5	146	2,112.0	Grove Creek
Sugar River	29N	11E	33	323	4,000.0	Sugar River
Trailside	43N	1E	25	9	None	
TOTAL FOREST PRESERVE HOLDINGS				2,098.5	47,512.0	

PUBLIC PARK LAND IN WINNEBAGO COUNTY AS OF 1970

Name	Twp.	Rg.	Sec.	Area Acre	Water Frontage (Feet)	Water Area
			Park District Holdings			
Rockford Park District						
Aldeen Park	44N	2E	20	88	2,000.0	Keith's Creek
Alpine Park	44N	2E	29	68	1,800.0	O'Roorguis Creek
Atwood Park	43N	1E	24	334	4,752.0	Kishwaukee River
Blackhawk Park	44N	1E	34	91	3,696.0	Rock River
Fairgrounds Park	44N	1E	22	25	1,040.0	North Kent Creek
Levings Park	44N	1E	28	123	4,224.0	Levings Lake
Page Park	44N	1E	8	317	9,720.0	North Kent Creek
Quarry Hill	44N	1E	8	115.0	3,240.0	North Kent Creek
Searle Memorial	44N	1E	9	202.0	280.0	North Kent Creek
Shorewood Park	44N	1E	12	39.0	1,600.0	Rock River
					1,760.0	Loves Park Drainage
Sinnissippi Park	44N	1E	13	123.5	5,000.0	Rock River
Talcott-Page	44N	1E	15	23.0	960.0	North Kent Creek
Twin Sisters Hills	44N	2E	30	17.0	2,200.0	Keith's Creek
Beattie Park	44N	1E	23	3.0	360.0	Rock River
Churchill Park	44N	1E	25	11.0	1,600.0	Keith's Creek
South Horace Ave. Playground	44N	1E	21	5.0	280.0	South Kent Creek
Martin Park	44N	1E	1	12.0	1,880.0	Rock River
Nelson Park	44N	1E	26	4.0	400.0	Keith's Creek
Tenth Avenue Playground	44N	1E	26	7.0	600.0	Keith's Creek
Tinker Park	44N	1E	27	6.0	520.0	So. Branch of Kent Cr.
Wantz Park	44N	1E	6	6.0	400.0	Loves Park Drainage
Guy Williams Park	45N	2E	19	10.0	100.0	Rock River
South Park	44N	1E	27	5.0	600.0	Rock River
Elliot Golf Course	44N	2E	25	146.0	2,640.0	Manning Creek
River Bluff Park	44N	1E	1	67.5	1,320.0	Rock River
Park District Office	44N	1E	23	3.0	100.0	Rock River
TOTAL WITH WATER FRONTAGE				1,851.0	53,072.0	9 Water Areas
OTHER PARK DISTRICT PROPERTIES				739.5	NONE	
GRAND TOTAL ROCKFORD PARK DISTRICT				2,590.5	53,072.0 Feet	

PUBLIC PARK LAND IN WINNEBAGO COUNTY AS OF 1970

Name	Twp.	Rg.	Sec.	Area Acre	Water Frontage (Feet)	Water Area
Sumner Park District						
Sumner Park	27N	10E	29	59.0	2,640.0	Pecatonica River
TOTAL SUMNER PARK DISTRICT				59.0	2,640.0	
TOTAL ALL PARK DISTRICTS				2,649.5	55,712.0 Feet	9 Water Areas
			TOWN PARK HOLDINGS			
South Beloit City Park	46N	2E	8	51.0	3,168.0	Lake Victoria
Cherry Valley Park	43N	2E	1	18.0	2,112.0	Kishwaukee River
Village of Roscoe						
Leland Park	46N	2E	33	18.0	400.0	So. Kinnikinnick
Roscoe School Park Site	46N	2E	33	6.0	None	
Durand School District	28N	10E	15	15.0	1,056	So. Branch of Otter Cr.
Pecatonica Fairground Playground	27N	10E	29	5.0	None	
Village of Winnebago						
Winnebago City Park	26N	11E	8.0	1.0	None	
Winnebago School Park	26N	11E	9.0	10.0	None	
GRAND TOTAL TOWN PARKS				124.0	6,736.0 Feet	4 Water Areas
			OTHER PUBLIC AGENCIES			
Rock Valley Junior College	44N	2E	10	157.8	1,056.0	Campus Lagoon
					2,640.0	Spring Creek

PUBLIC PARK LAND IN WINNEBAGO COUNTY AS OF 1970

Name	Twp.	Rg.	Sec.	Area Acre	Water Frontage (Feet)	Water Area
Rockford Sanitary District	43N	1E	2		2,920	Rock River
Greater Rockford Airport Authority	43N	1E	15		12,000.0	Rock River
Greater Rockford Airport Authority	43N	1E	23		3,168.0	Kishwaukee River
TOTAL OTHER PUBLIC				1570+	21,784.0	
TOTAL PUBLIC LANDS & FRONTAGE				6229.3	161,312.0	
TOTAL WINNEBAGO COUNTY					30.5 Miles	

Based on the projected 1970 population figure of 257,197 residents, Winnebago County presently has 4.1 acres of recreational land per capita, placing it well ahead of most of the counties surrounding it. For instance, Boone County residents only have access to a total of 0.2 acre per capita. While Winnebago County's population has access to many acres of park land there is only one large recreational lake, Pierce Lake, to serve the residents and this area is already grossly over used. It is imperative that in the not too distant future, either the Rockford Park District or the County Forest Preserve District give serious consideration to land acquisition and construction of the largest possible recreational lake. With the population likely to reach over 400,000 persons by 1985, many of the close in sites for recreational lake development will have been subdivided and thereby lost to the general public.

The Open Space report states that there will be a need for an addition of 4,035 acres of recreational land. Part of this total will be made up by the already planned acquisition of an additional 1,700 acres at Rock Cut State Park.

Future land acquisition for open space in Winnebago County ought to be carried out on a priority basis with the most close in areas purchased first before they are lost forever. If some of these tracts cannot be purchased immediately, they ought to be leased or reserved by appropriate zoning. The Planning Commission's Open Space document lists many avenues through which the needed open space can be procured.

Table 16, lists those areas which in the author's and others' estimation ought to be considered for inclusion into the regions' park systems. They are also pinpointed on Figure 13. In all there are 21 such sites worthy of consideration, many, of which, are mentioned in the Open Space plan.

COTTAGE AND HOMESITE DEVELOPMENT

Land developers saw the potential of lake and river frontage many years ago; however, in the early days, most of the shoreline development was in the form of summer cottages. As Northern Illinois became more and more urbanized a segment of the population decided to give up city living and began to take up permanent residence in rural areas.

In Winnebago County, this form of development began to blossom forth in the early 1960's. During this decade, there was a 76.3% increase in rural residences. Such subdivisions as Lakewood Hills, Parker Woods, Spring Lake Estates, River Crest, etc., rapidly filled. The newest of these subdivisions, Lake Summerset, was begun in 1968, and has already sold all but 500 of its 2,000 lots.

Frontage along the Rock and Kishwaukee Rivers is already at a premium. The Pecatonica will be next and for this reason, it is imperative that recreational planners redouble their efforts and reserve the best water based and other wildlands for public recreational development only. As was previously mentioned, provisions ought to be incorporated into the Zoning Code stipulating that there be some public access provided on any impoundment exceeding 150 acres in size.

TABLE 16

RECOMMENDED INCLUSIONS TO WINNEBAGO COUNTY RECREATIONAL LAND *

Name	Twp.	Rge.	Sec.	Purpose
1) Pasque Flower Prairie Hills	45N	1E	33	Preservation
2) Rock Creek Reservoir Site	43N	1E	18	General Outdoor Recreation
3) Aldeen Park Expansion and Lake	44N	2E	20	Fishing & General O. Rec.
4) Ambystoma Meadow	43N	2E	9	Habitat Preservation
5) Mulford Woods	43N	2E	15	Fishing Access
6) Bell Bowl	43N	1E	23	Preservation
7) N. Kinnikinnick Reservoir Creek	46N	2E	25	General Outdoor Recreation
8) Raccoon Creek Marsh	46N	1E	3-4 9-10	Preservation
9) Sugar River Sand Hills	29N	11E	29	Preservation
10) Pecatonica Floodplain	46N	1E	28-29	Fishing Access
11) Tunnison Slough	28N	1E	33	Canoeing Access
12) Dells Forest Preserve	26N	11E	34-35	Scientific Study
13) Rockton Dam	46N	1E	14	Fishing Access
14) Page Park Reservoir	44N	1E	7	General Outdoor Recreation
15) Coolidge Creek Reservoir Site	27N	11E	31	General Outdoor Recreation
16) Grove Creek Reservoir Site	26N	10E	5-6	General Outdoor Recreation
17) Randall Creek Reservoir Site	29N	10E	32-33	General Outdoor Recreation
18) Seward Marsh	26N	10E	9-10	Preservation
19) Otter Creek Access Area	28N	11E	5-6 28-21	Fishing Access
20) Rock Cut Addition	45N	2E	22-23	General Outdoor Recreation
21) Kishwaukee Mouth	43N	1E	21-22 27-28	Fishing Access

* Source - Rockford City County Planning Commission, Rockford, Illinois.
- Natural Land Institute, 815 North Main, Rockford, Illinois.

PRESENT AND POTENTIAL USE OF SURFACE WATERS

The usage of our surface waters and recreational lands is ever expanding but in a wide variety of directions. As the population of Winnebago County increases and urban sprawl pushes further out into the environs, this usage will be much more diverse and intense. The following section is an analysis of present usage levels, in so far as they are known and offers ideas as to what the future holds. The following topics will be considered: fishing, boating, swimming, camping, hunting and trapping; and aesthetics and nature study.

FISHING (SPORT AND COMMERCIAL)

The present usage of Winnebago County's surface waters can be generally classed as moderately heavy. Most of the fishing pressure is concentrated on the county's major waterways, the Kishwaukee, Pecatonica, Rock and Sugar rivers. Of the four rivers, the Rock receives the heaviest fishing pressure, due in part to the fact that it is the most readily accessible to the general public. Of the impounded surface waters, Pierce State Lake receives the heaviest pressure. Table 17 presents data from three separate angler creel census carried out in the summers of 1964-1965 and the winter of 1966-1967. As can be seen from Table 17, anglers made an average of 45,313 trips to the lake and fished an average total of 117,892 hours during the period catching 84,000 fish each year. Interestingly enough, ice fishermen during the winter of 1966 caught an estimated 40,800 fish mostly bluegills, which is almost half of the summer catch. During the same period, total park attendance averaged 696,547. Anglers made up roughly 6.5% of the visitors to the park those years. If this percentage holds then in 1969, based on an attendance of 1,363,760, approximately 88,644 angling trips were made to the lake during the summer period. Using an average of 2.5 hours per trip, then the fishing pressure in 1969 was 1,367 man-hours of effort per acre of water. This is excessive fishing pressure, and certainly demonstrates the need for more publicly accessible fishing waters in northeastern Illinois.

Figure 14 is a graphic comparison of the sport fishing license sales of Winnebago County to the entire state for the past 20 years. In both cases, the trend is similar with county sales reaching an early high of 18,879 in 1955. (State in excess of 800,000 licenses). From 1956, there is a general downward trend until 1961 when the state's sales leveled off at approximately 670,000. During the 1960's Winnebago County's sales have shown a marked increase (Appendix 7) reaching a 20 year record high of 21,828 in 1968 (State - 791,999). The only known quantitative increase in Winnebago County's sport fisheries resource since the creation of Levings Lake in the 1920's has been the opening of Pierce Lake in 1962 and the creation of Four Lakes Forest Preserve about the same time. Our creel studies at Pierce Lake have shown that 75% of the anglers utilizing it come from 25 miles or less. (Lopinot 1965-1966). Little data concerning fishing pressure exists on the other bodies of water in the county.

Data from the Winnebago County Forest Preserve District shows that for the 1969, summer season, their estimated attendance was 187,200, some of which were anglers. The Rockford Park District offers 1,260,106 as an attendance figure for the larger parks with water access during 1969. Of these areas, Page Park led the pace with 168,100.

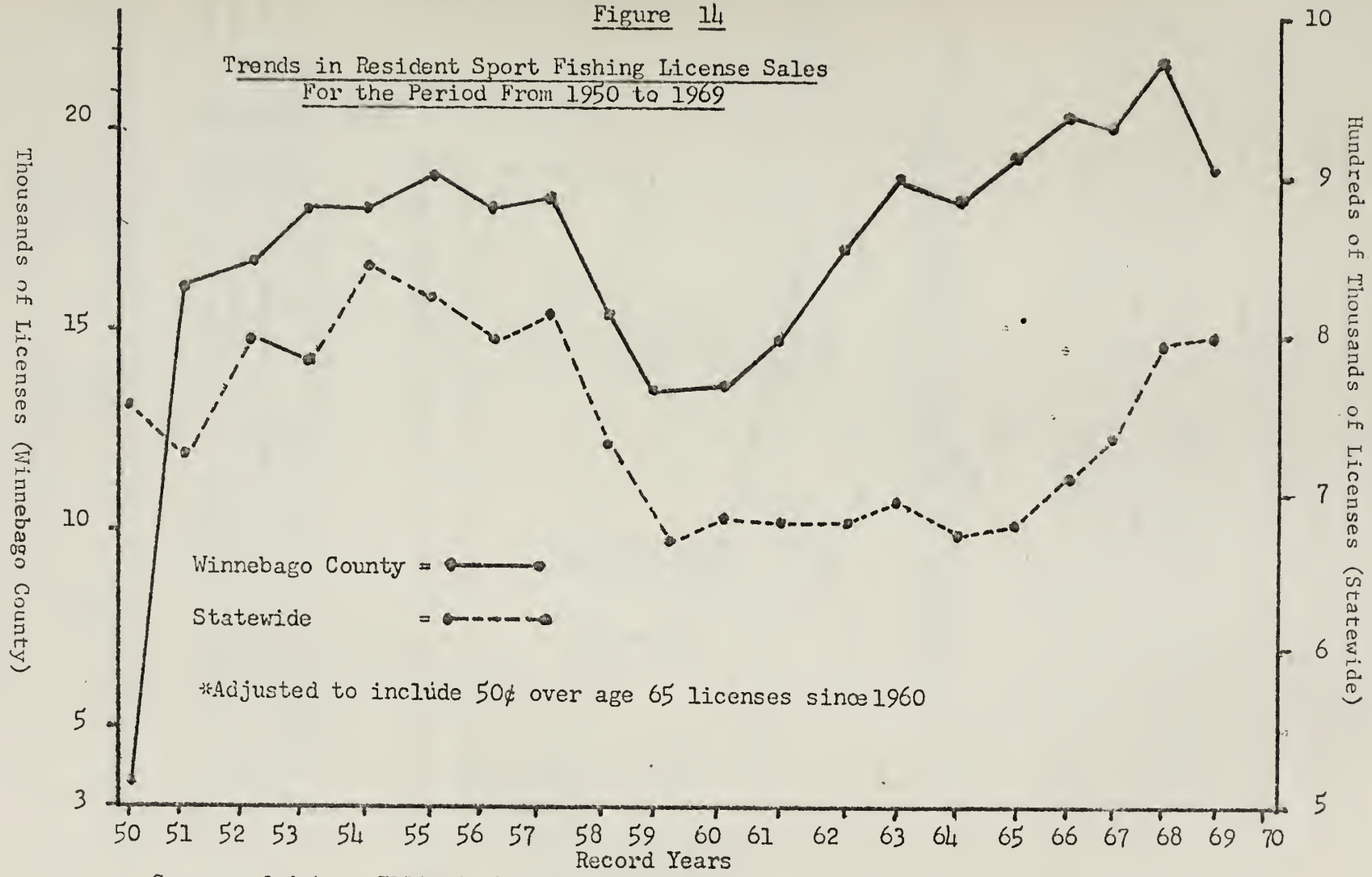
TABLE 17

A COMPARISON OF THE PROJECTED SPORT FISHERIES CATCH, FISHING PRESSURE, EXPLOITATION AND OTHER DATA DERIVED FROM THE 1964 AND 1965 SUMMER AND THE 1966-1967 - 14 DAY WINTER CREEL CENSUSES AT PIERCE STATE LAKE NEAR ROCKFORD, ILLINOIS

LEGEND:	SEASON	SUMMER		WINTER
	YEAR	1964	1965	1966-1967
FISHING TRIPS:				
Boat		10,850	10,643	
Bank		41,067	28,067	
Combined Total		51,917	38,710	4,250
HOURS FISHED:				
Boat		38,486	34,533	
Bank		94,479	68,286	
Combined Total		132,965	102,819	10,200
NUMBER OF FISH CAUGHT:				
Boat		23,170	37,357	
Bank		59,203	49,059	
Combined Total		82,373	86,416	40,800
TOTAL POUNDS OF FISH CAUGHT:		41,288	13,407	6,120
CATCH RATE (FISH/HOUR):				
Boat		0.60	1.08	
Bank		0.63	0.72	
Both Types		0.62	0.84	4.0
AVG. # HOURS/COMPLETE TRIP:				
Boat		3.5	3.2	
Bank		2.3	2.4	2.5
LENGTH OF CREEL PERIOD (DAYS):		146	146	100
Boat Rentals		1,500	4,192	
Campers		16,599	28,339	
Total Park attendance		761,811	631,284	
Pounds Fish Caught/Acre		255.0	82.8	37.7
MAN-HOURS FISHING PRESSURE/ ACRE		821.0	635.0	63.0

Figure 14

Trends in Resident Sport Fishing License Sales
For the Period From 1950 to 1969



Source of data - Illinois Department Conservation, Division of Accounting, Springfield

Private ponds and road bridges on the smaller streams accommodate some public fishing; however, the extent of this remains unknown. Most rural landowners hesitate to allow trespassing across their property or access to their impoundments for fear of possible accidental injuries and to lessen liability claims arising from same. This problem has been lessened somewhat by recent rulings, requiring more stringent proof of negligence on the part of the landowners.

In a random survey of licensed anglers conducted in 1965 (Lopinot - 1967) by the Illinois Division of Fisheries, it was found that Winnebago County anglers contacted (99) preferred to fish rivers - first, lakes - secondly, and few iced-fished. They were evenly divided between those who desired to catch a few large fish and those who didn't particularly care what kind of fish they caught. Most of the county's anglers say they use spinning and casting rods. Those with a preference said that they sought the following species: northern pike, catfish, smallmouth bass, bluegill, and largemouth bass in that order. The county's anglers caught mostly bluegill, crappie and catfish.

TABLE 18

MAJOR SPECIES COMPOSITION OF THE TOTAL CATCH DURING THREE CREEL PERIODS AT PIERCE STATE LAKE 1964, 1965 and 1966-1967*

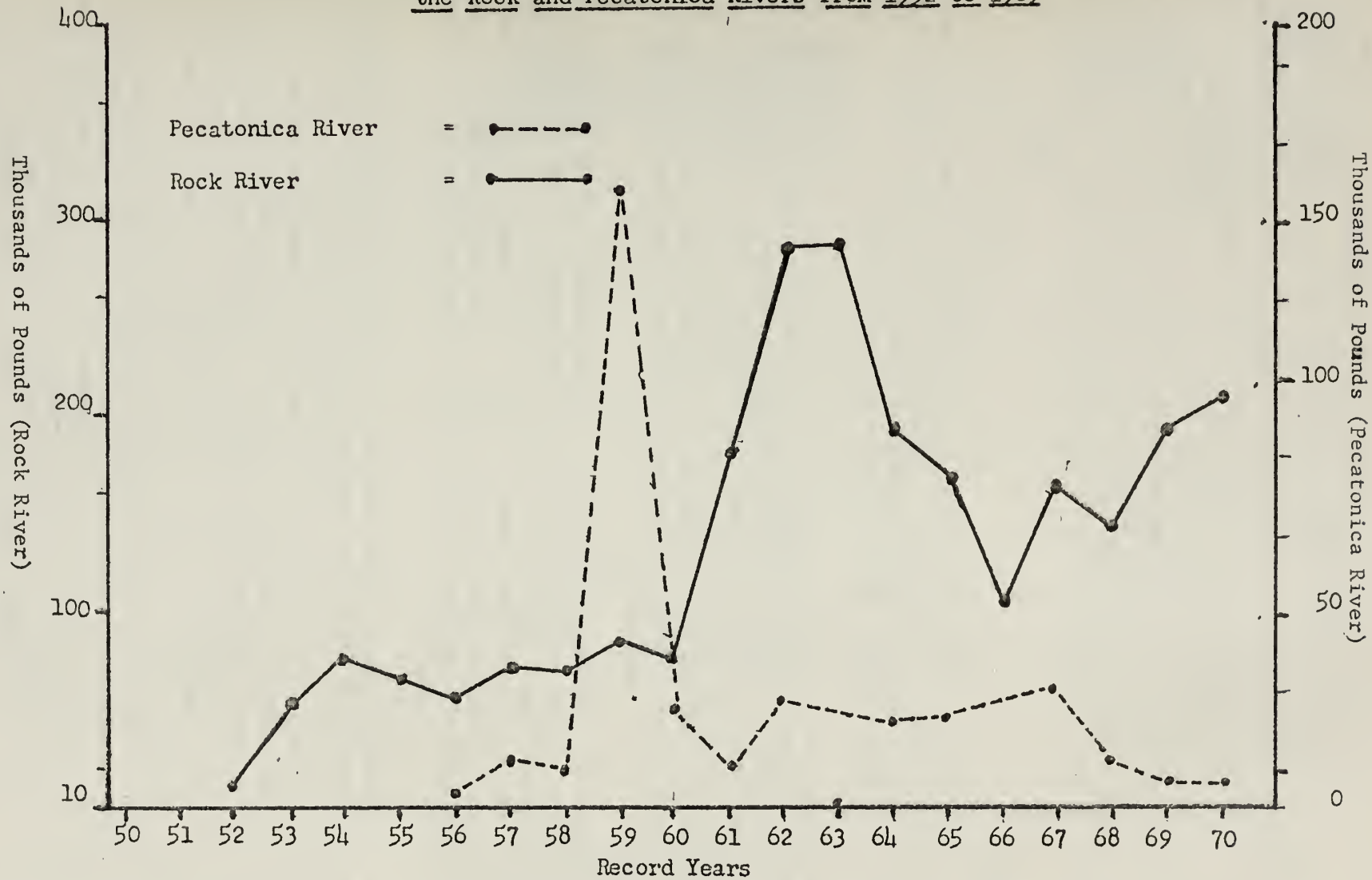
SPECIES	1964 Percentage	1965 Percentage	1966-1967 (Winter) Percentage
Bluegill	50.8	84.3	99.7
Largemouth bass	16.3	5.2	0.2
Black bullhead	15.3	9.1	--
Green sunfish	10.8	1.0	--
Walleye	4.6	0.3	--
Hybrid sunfish	2.1	--	--
Northern pike	0.4	--	--
White sucker	--	0.1	--
Black crappie	--	--	0.1

* Illinois Division of Fisheries, Special Fisheries Reports 6 & 10, Springfield, Illinois.

Table 18 shows the fish species which comprised the total catch during the three creel periods at Pierce State Lake. In all catches, bluegill were the most prominent species in the catch followed by largemouth bass and black bullheads. In early years, walleye occurred in goodly numbers but tended to disappear as their population began to dissipate. In 1968 and 1969, the black crappie came into prominence and were probably the third most abundant fish in the catch.

When asked what should be done to improve fishing in the state, the county's anglers reply was pollution control followed by more lakes and more access.

Figure 15
Total Commercial Catch of Fish in Pounds for the Rock and Pecatonica Rivers from 1952 to 1969



Source of Data: Illinois Division of Fisheries, Springfield, Ill.

Figure 15 is a graphic presentation showing the commercial catch of rough fish in pounds for both the Rock and Pecatonica rivers for the past 16 years. The species which comprised this catch in the Rock River are in order of abundance: buffalo, carp, carpsuckers and other suckers. In the Pecatonica River, the catch was predominated by carp followed by buffalo. The grand total (Appendix 8) for the past 18 years is 2,250,633 pounds harvested from the Rock River and 349,881 pounds from the Pecatonica River. Data for the Winnebago County portion of the Rock and Pecatonica rivers is available for only 1961 and 1969, and shows that the catch in the county tends to average 25,000 pounds for the Rock River and 8,500 pounds for the Pecatonica. Using the figures from these two years, we find that the Winnebago County portion of the total catch on the Rock River is 13.4% or 301,585 pounds. As can be seen by this 18 year figure, the commercial harvest of rough fish is of little significance to the fishery of the Rock River in Winnebago County but at least these species are being harvested.

BOATING

Since April, 1960, residents of Illinois have been required to register all motor driven boats. In 1967, sail boats larger than 12 feet were also required to be licensed. Figure 16 is a graphic presentation of the trends in boat license sales for both Winnebago County and the State as a whole.

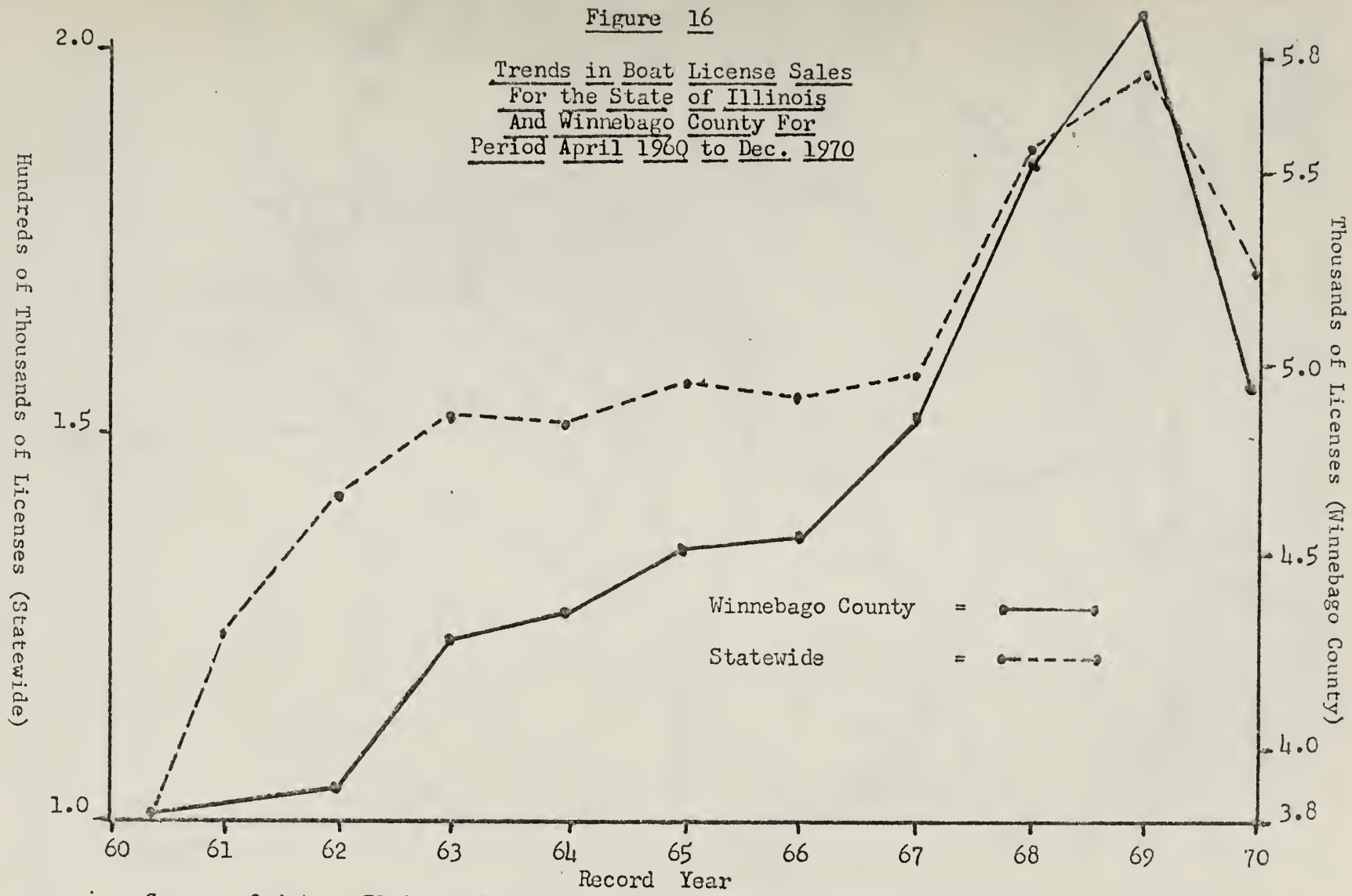
Boating began to blossom into a major activity as early as the late forties. Pleasure boat and trailer sales sky rocketed as did registration. Data is presented in Appendix 7 which shows the number of boaters (with Winnebago County as their home port) who have purchased licenses since 1960. The first year's tabulation shows an initial registration of 3,894 boats in the county (approximately 120,000 for the state). Since the initial registration Winnebago County boaters have shown a steady increase to 5,645 as of December 31, 1968 (Statewide has leveled off at approximately 188,000).

Due to the tremendous increase in the popularity of boating, many new marinas have sprung up along our lakes and waterways. Established firms in northeastern Illinois have remodeled their facilities to include storage sheds, concrete ramps, rental docks, power hoists, and in some instances offer caulking, painting and repair services. Many of these areas which in past years had catered to the fishermen by selling bait and renting boats no longer do so since the owners of large pleasure craft will spend more money on their sport.

In Winnebago County, power boating has been relegated primarily to the Rock River and especially the Fordam pool which begins at Morgan Street and runs upstream to Rockton, a distance of approximately 15 miles. Actually power boating north of Roscoe is limited to that part of the year when water levels are high. A small amount of boating occurs below the Fordam Dam with the primary access point being Blackhawk Park located at the Fifteenth Avenue Bridge. There is a small private launching ramp at Blackhawk Island near the Beltline Bridge. On the Fordam Pool, there are four public and two fee launching areas. (Figure 17) The newest of these is the River Bluff Marina which is presently being developed jointly by the Rockford Park District and Illinois Department of Conservation. A limited amount of power boating is done on the Pecatonica River, although the stream by its size, and abundance of deadfalls restricts boating primarily to small fishing craft. Presently the only launching ramp occurs in Macktown Forest Preserve at the river's mouth. In 1971, the county plans to develop a ramp at the newly acquired Pecatonica Forest Preserve and future plans call for the purchase of an additional access area somewhere between the two previously mentioned.

Figure 16

Trends in Boat License Sales
For the State of Illinois
And Winnebago County For
Period April 1960 to Dec. 1970



Source of data - Illinois Department Conservation, Division of Accounting, Springfield

FIGURE 17 BOATING AND CAMPING AREAS IN WINNEBAGO COUNTY

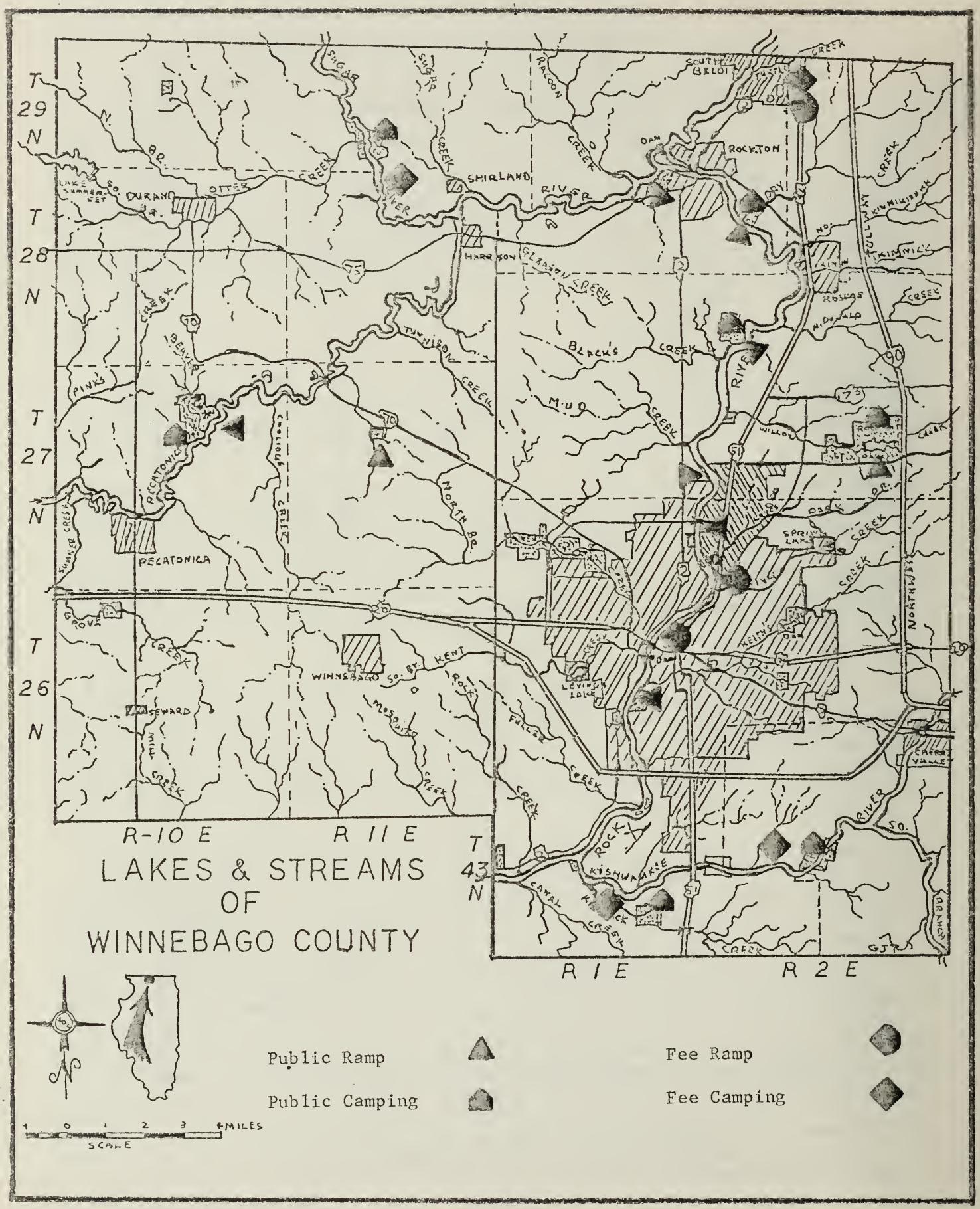
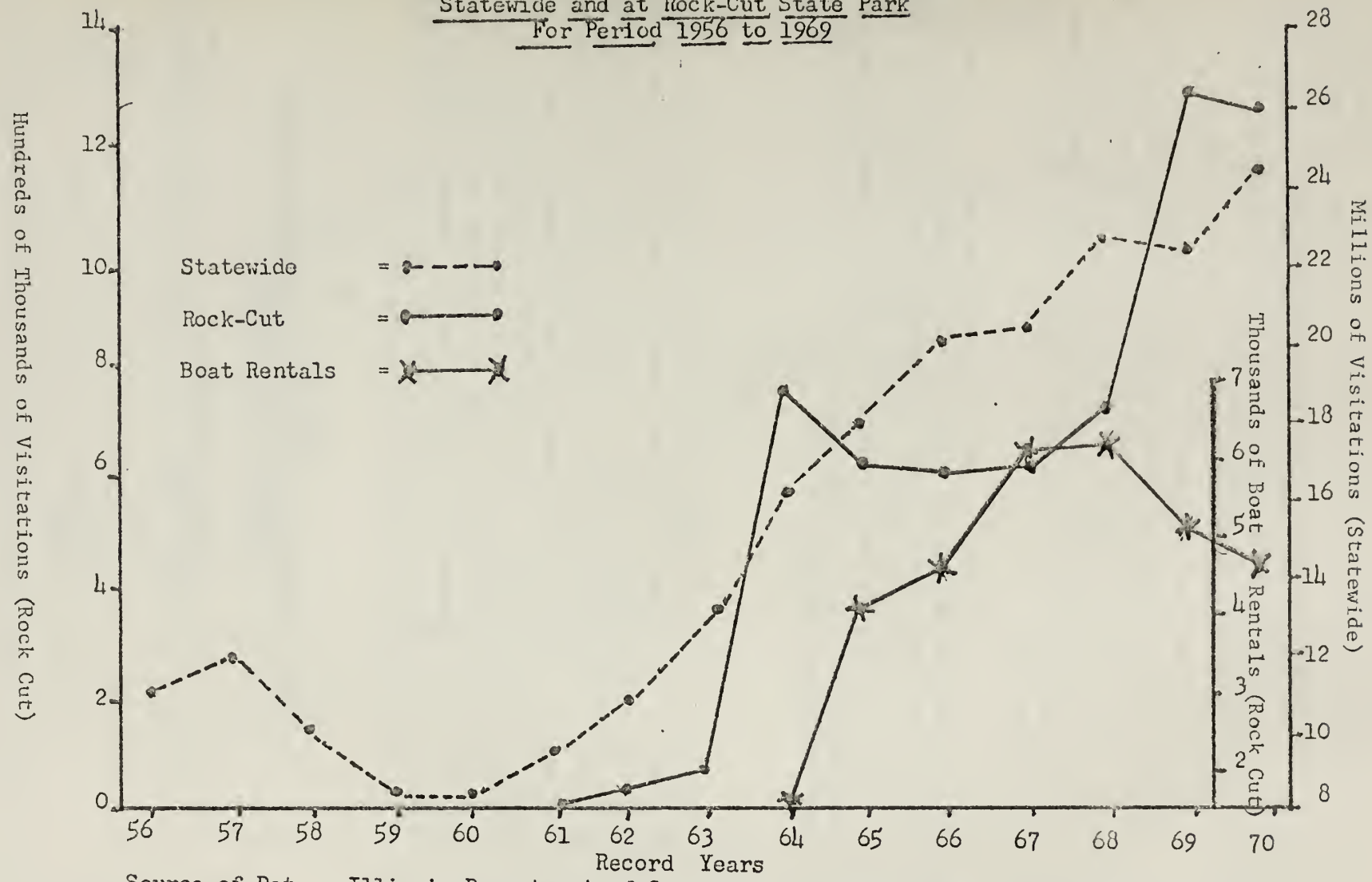


Figure 18

Trends in Park Attendance and Boat Rentals
Statewide and at Rock-Cut State Park
For Period 1956 to 1969



Source of Data - Illinois Department of Conservation, Divisions of Parks and Memorials and Division of Accounting Records, Springfield

Figure 18 is a graphic presentation of the boat rentals at Pierce State Lake since 1964. As can be seen from this data and Appendix 9, during the seven years which the boat concession has been in operation, boat rentals have increased from 1500 (40 boats) in 1964 to 6,194 (60 boats) in 1968. Of interest is the fact that the 1964 total boat rentals occurred from August 1st through Labor Day. This data certainly shows the public's appetite for use once facilities are provided. The drop in boat rentals for 1970 can be attributed to the draining of Pierce Lake which occurred on the 8th of September, thereby cutting off almost two months from the rental period.

In recent years we have witnessed a boom in another form of boating and that is sailing. Once a sport primarily practiced on the open seas and the Great Lakes, it is becoming increasingly popular on our inland lakes. In Winnebago County, sailing is practiced almost exclusively on Pierce State Lake; however, it most likely will also become popular on Lake Summerset once it fills. For the past three years, the Rock Valley Sailing Club has held summer regattas on Pierce Lake.

Canoeing, which dates back to our prehistoric ancestors, is rapidly gaining momentum in the United States. Quite a bit of canoeing is done on Rock River. One of the local marinas rents canoes which people use to float downstream to Byron or Oregon for picnics. Some canoeing is done on the Pecatonica and Sugar rivers as well as the Kishwaukee. Both the Kishwaukee and Sugar rivers are considered private streams and in many cases, fences have been placed across them by owners of adjacent lands.

CAMPING

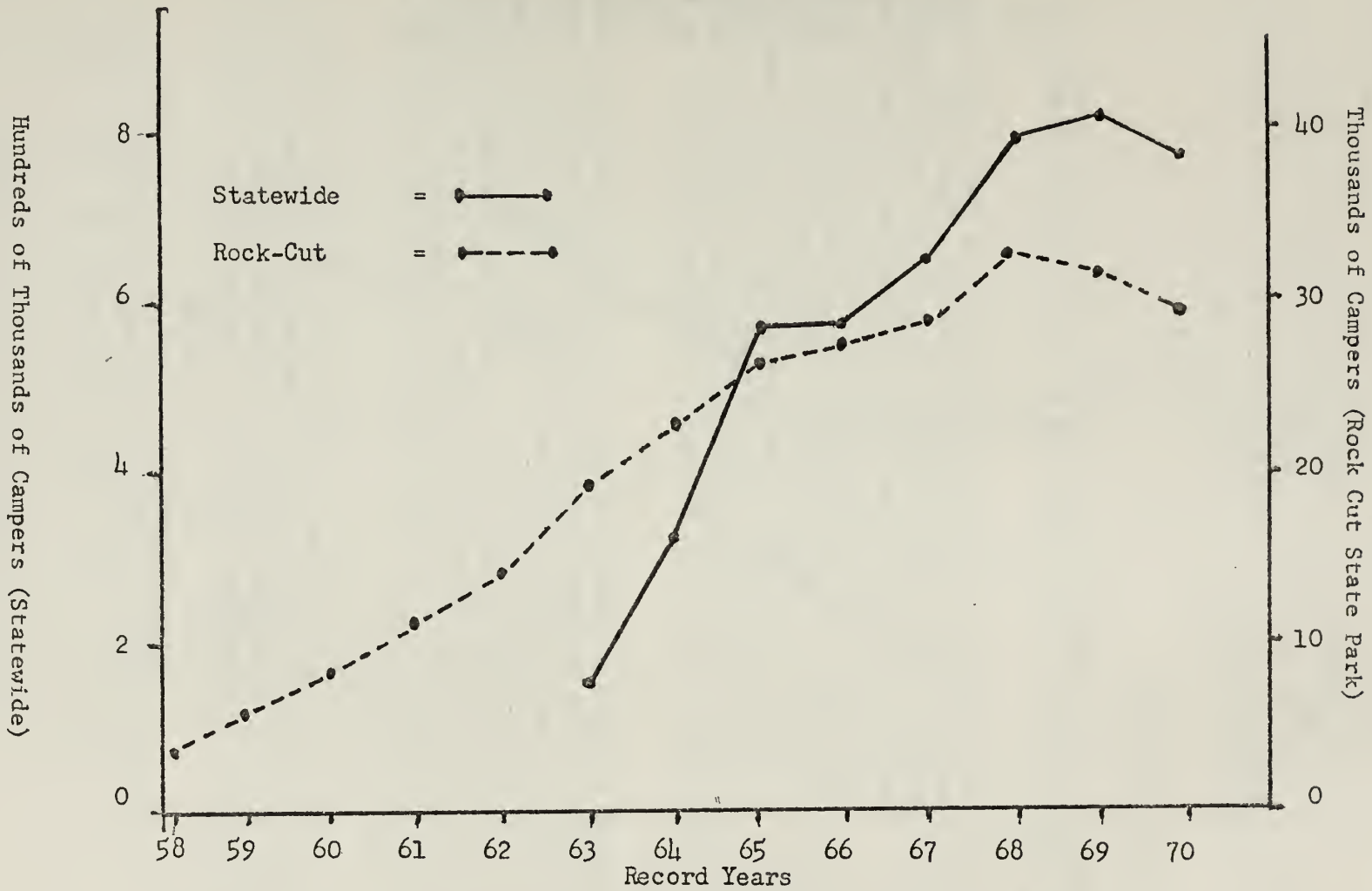
Camping is perhaps the fastest growing activity at both state and federal recreation areas. Division of Parks and Memorials statistics show that at the 58 recreational areas offering camping, the total yearly camper days has increased from less than 200,000 in 1961 to 660,074 in 1968. Figure 19 shows in graphic form the trends in camper utilization of our state facilities during the past 12 years. When Rock Cut State Park was officially opened in 1963, 7,759 campers utilized the area (Statewide 383,401). Camping as a form of recreation has blossomed to the point where Rock Cut in 1969 played host to 40,846 (Statewide 630,869) campers placing it second in the state in references to this usage. To accommodate this surge of public camping, the park has expanded its facilities from an initial 94 sites to its present level of 450 and is in the process of opening several new areas to this use.

TABLE 19
CAMPER ATTENDANCE FIGURES FOR PUBLIC CAMP GROUNDS
OTHER THAN STATE PARKS *

Date	Rockford District Youth Camp	Forest Preserve Camp Sites
1970	11,327	5,897
1969	10,543	6,500
1968	10,338	-----
1967	8,596	-----

* Source of Data: Rockford Park District and Winnebago County Forest Preserve District files, Rockford, Illinois.

Figure 19
Trends in Camper Usage of Illinois
State Parks Statewide and at Rock-Cut State Park
For the Past Ten Years.



Source of Data: Illinois Dept. of Conservation, Division of Parks and Memorials, Springfield, Ill.

The Winnebago County Forest Preserve District has yet to get in the camping business in a big way. They do, however, allow camping at Kishwaukee, Kilbuck, Atwood Homestead, Hononegah and Sugar River Preserves and have plans to develop a camp site in the newly acquired Pecatonica Preserve and at Seward Bluffs Preserve. There are presently four fee camping areas in the county which have a total of 340 camp sites. From conversations with the owners of these areas, the author has ascertained that in 1969, they accommodated approximately 11,800 campers.

By combining the attendance figures for all known camping areas in Winnebago County, we arrived at a grand total of 69,769 campers utilizing Winnebago County recreational areas in 1969.

HUNTING AND TRAPPING

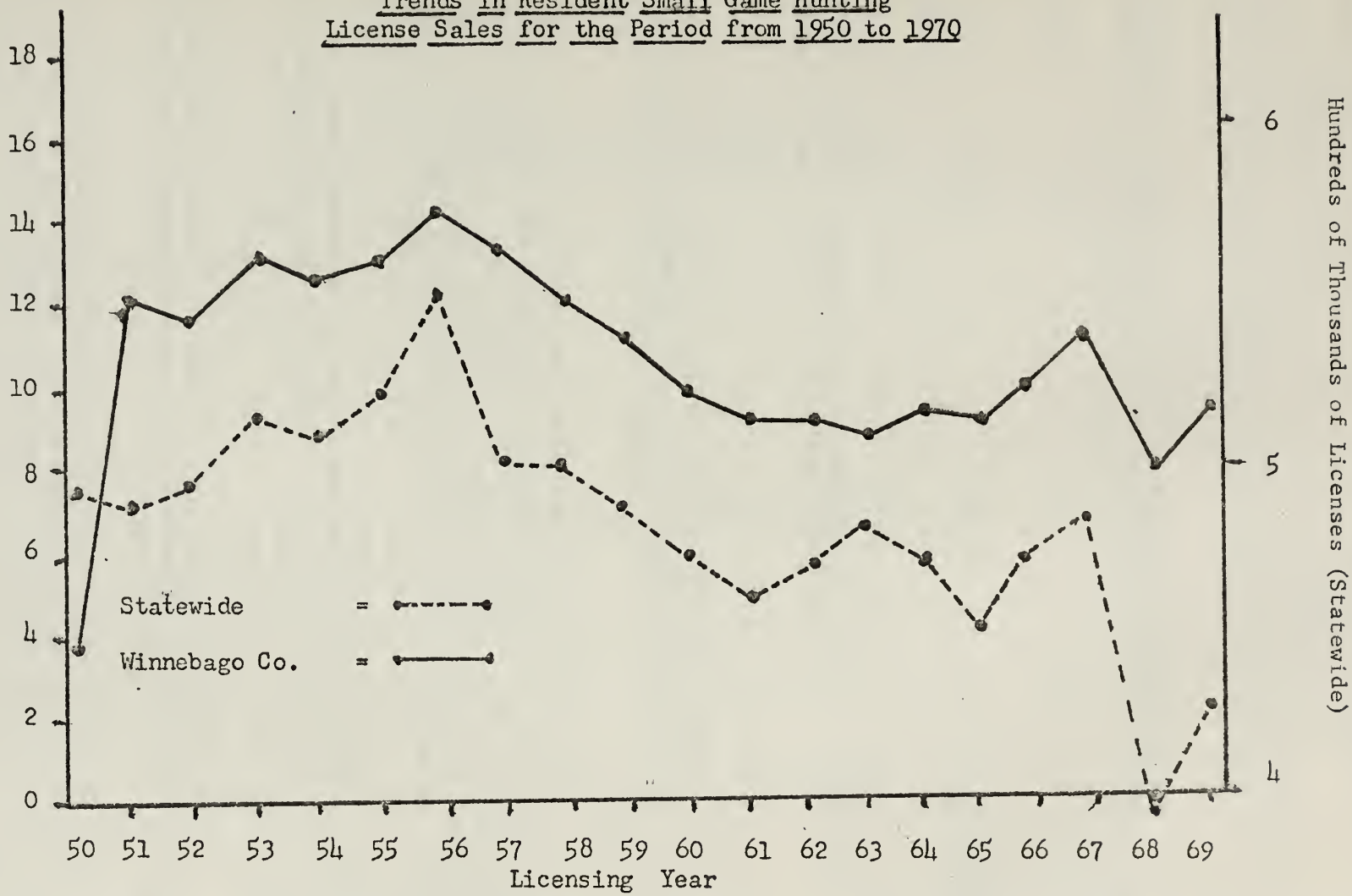
Hunting, like fishing, is one of "man's" oldest endeavors, finding its origin in the species' quest for survival from its mist shrouded prehistoric beginnings to the late 1800's.

Figure 20 presents in graphic form the trend in small game hunting license sales for Winnebago County and the State of Illinois since 1950. The general trend for both Winnebago County and the State as a whole has been downward since the late fifties. There was a slight increase in 1956 following the return of Korean War veterans, but the increase was short-lived and the depression in sales continued until the early 1960's when they began to diverge somewhat with statewide sales reaching a 17 year low of 450,000 in 1965. Winnebago County licenses sales after reaching a low of 8,876 in 1963 climbed to 11,927 in 1967 (Appendix 7). In 1968, both the state and county license sales dropped off considerably, the plain and simple reason being a sportsman rebellion toward the newly instituted firearms' owners registration law. Sales of hunting licenses bounced back in 1969 on both levels.

A basic change in hunting attitudes took place in the 1960's. That was the rise in popularity of the fee-hunting area, and also out of frustration the leasing of hunting rights from the rural landowner by small groups of hunters and even large clubs. All this was made possible due to a newly found affluency in the middle income group. This trend has been a boom to both the landowners and club members; however, it has left the non-organized hunter out in the cold with an ever diminishing amount of land to hunt. Public hunting areas must be located near the Metropolitan Rockford area if the county's 46,000 hunters are to have a place to enjoy their sport in the future.

Four species of upland game birds presently occur in Winnebago County - they are ringneck pheasant, mourning dove, hungarian or grey partridge and bobwhite quail in their order of abundance. Table 20 presents data compiled by Illinois Upland Game Specialist, William Preno, from hunter questionaires collected in 1964, 1965 and 1966.

Figure 20
Trends in Resident Small Game Hunting
License Sales for the Period from 1950 to 1970



Source of Data: Illinois Department of Conservation, Division of Accounting, Springfield

TABLE 20

A COMPARISON OF GAME BAGGED PER HUNT BETWEEN WINNEBAGO COUNTY AND STATEWIDE HUNTERS DURING THE PERIOD 1964-1966 *

	SPECIES					
	Doves	Pheasant	Squirrel	Hun	Rabbit	Quail
Three Year Average for Winnebago Co.	2.16	0.54	1.32	0.30	0.71	0.28
Statewide Average for Same Period	3.50	0.77	1.97	0.52	1.82	2.47

* Data Source - Illinois Department of Conservation, Division of Wildlife Resources, Mr. William Preno, Upland Game Staff Biologist

As seen from Table 20 in recent years, Winnebago County gunners have fared well on their bag of squirrels, "huns", and pheasants in comparison to mister average Illinois hunter. They, however, have not done so well on doves, quail or rabbits.

Mr. David Klinedinst, the District Game Biologist, states (personal communication) that the county's pheasant population has been slowly but surely rising since 1963. He does not feel, however, that it will ever again reach a peak attained in the county 15 years ago because of the scarcity of suitable undisturbed nesting cover. Scant data exists on the total county kill for most species. Preno's data from the 1957-1958 season shows that the estimated county wide harvest for doves, pheasants, and quail was 6,760, 5,512 and 2,080 respectively. Partridge hunting has been allowed since 1963 and a ratio of one "hun" to every eight pheasants bagged would seem to be common to the county. Although they occur throughout, partridge concentrations seem to be highest along the eastern border and in the southwest portion of the county; although, they are very rarely taken by the hunter in large numbers anywhere.

Northern Illinois is very near the northern limit of the quail's range and due to the scarcity of suitable cover and our extended periods of sub-zero temperature, winterkill is common.

Because of the lack of extensive forested areas, squirrel hunting is at a premium in the county's scattered woodlots and is best along the Kishwaukee and Pecatonica river bottoms; yet, access to these areas is becoming increasingly difficult to obtain. Yeatter (Mills, H., et al. 1960) indicates that in 1957 successful Winnebago County hunters bagged an average of five squirrels per hunt as compared to 18 or more on better range, Preno's Data indicates approximately 15,000 squirrels were killed in the county in 1957; 60% of which were fox and the rest, grey squirrels. His present data (Table 21) would indicate that hunter

success has dropped considerably in the past 12 years. The little red squirrel disappeared from the county following the removal of the virgin stands of evergreens in the 1800's.

Deer hunting parallels that of squirrels since both are carried out for the most part in woodlots. Winnebago County was reopened to deer hunting in 1957 and Table 21 indicates the harvest of this species to the present.

TABLE 21

A COMPARISON OF THE SHOTGUN HARVEST OF DEER IN WINNEBAGO COUNTY TO HUNTING PRESSURE FOR PERIOD 1957 TO 1970 *

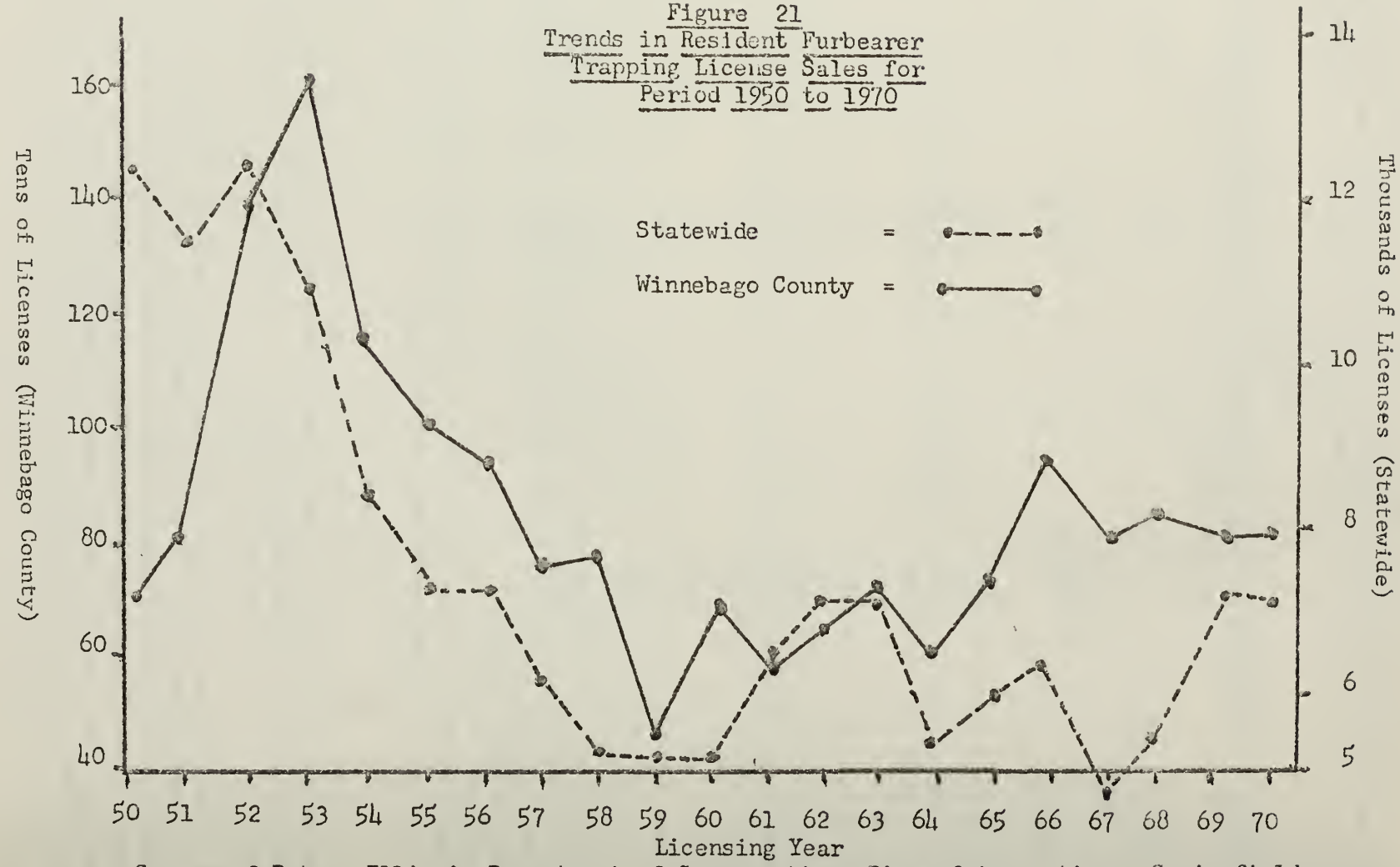
Year	Number Hunters	Deer Harvest	Hunter Success Ratio
1957	NDA	196	NDA
1958	NDA	233	NDA
1959	NDA	159	NDA
1960	NDA	112	NDA
1961	NDA	112	NDA
1962	1,135	156	1:6
1963	1,095	148	1:7
1964	857	110	1:7
1965	870	88	1:9
1966	856	95	1:9
1967	849	71	1:11
1968	709	93	1:7
1969	897	86	1:10
1970	832	79	1:10
Totals	8,090	1,738	1:8
14 Year Average	899	124	1:8

NDA - No Data Available

* Source of Data - Forrest Loomis, Forest Game Staff Biologist, Illinois Department of Conservation.

The data presented in Table 21 indicates that the shotgun deer kill in Winnebago County is fairly light, as would be expected, due to the lack of extensive forested areas and the problem of hunter access. Following the initial pulse after the re-opening of the season hunting pressure has continued to decline to a low of 709 in the field in 1968. The poor harvest in 1967 was primarily due to weather conditions which made it impossible for farmers to harvest their crops. In summary, the data shows that during the past 14 years an average of 899 deer hunters have taken to the field and have harvested an average of 124 deer per year which is a success ratio of one deer for every eight hunters. The statewide average kill for the record years was one deer per every five hunters. In 1970, the largest deer taken weighed 249 pounds.

Figure 21
Trends in Resident Furbearer
Trapping License Sales for
Period 1950 to 1970



Source of Data - Illinois Department of Conservation, Div. of Accounting - Springfield

Illinois Division of Forestry personnel indicate that over the past 17 years, they have sold 1,702,654 trees to residents of Winnebago County, which if planted properly would amount to 1,702 acres of woodlands. Some of these trees are pines sold for Christmas trees; however, the remaining acreage when mature should be of immeasurable benefit to forest game species.

The cottontail rabbit is hunted in the county and figures from the 1957 survey show that less than 10 were bagged by each successful hunter as compared to over 20 per hunter in good habitat. The data in Table 21 indicates that rabbit hunter success has dropped considerably in the 10 years since the 1957 study. The estimated rabbit harvest during the 1957-1958 season is reported as 39,520, presently it is much less. The factors which tend to influence low rabbit density - (1) clean farming, (2) hedge row removal, and roadside thistle spraying have severely reduced the much needed escape cover, and (3) a low density of the woodchuck or groundhogs leaves the animals wanting for winter burrows.

Bellrose (Mills, H. et al. 1960) states that over 1,000,000 ducks cross over northern Illinois during the migration season. The Rock River Valley is utilized extensively as a resting, loafing and feeding area during the spring and fall. The many oxbow lakes and ponds along the Pecatonica and Sugar rivers offer excellent habitat for waterfowl and their hunters. In winter, there are small flocks of Goldeneyes which utilize open waters near Roscoe and a large resident flock of mallards stays in the pool below the Fordam dam in Rockford. Pierce State Lake and Lake Summerset are rapidly becoming major resting and feeding areas. Many Winnebago County waterfowl enthusiasts also pursue their sport on the Illinois and Mississippi rivers.

Furbearer trapping license sales, since the early fifties, have shown a general decline in the county (Figure 21) as well as over the whole state. Mohr (Mills, H. et al. 1960) indicates that while this is true the annual harvest of the fur trade has remained relatively stable during the past 20 years. The shift has been from trapping to hunting such animals as the raccoon and fox. Winnebago County is listed as a medium area for muskrat and mink. Mohr further states that the average yearly per trapper harvest from Winnebago County for the period from 1954 to 1956 was less than 60 muskrats, three mink and three raccoon. Muskrat and mink populations have increased tremendously at Pierce State Lake and in recent years, the "rats" have had to be thinned due to destruction and under cutting of the lake shore.

Data obtained from a fur buyer in Forreston (Ogle County) indicates that in 1966, Winnebago County trappers sold him the following: 2,500 muskrats, 40 mink, 15 beaver, 2,000 raccoon and a combined total of 200 red and grey fox. District Game Biologist, David Klinedinst, feels that trapping pressure is declining and his conclusion is well substantiated by the trend in license sales from a 17 year high in 1953 of 159 (statewide 11,000 plus) to the present 10 year average of 73 license holders.

AESTHETICS

Winnebago County with its scenic Rock, Pecatonica and Kishwaukee rivers, scattered small to medium sized woodlots and undulating morainal topography to the west has much to offer the observant traveler. The development of stream shores for housing destroys to some extent their aesthetic appeal but, nevertheless, residents of the areas must derive some measure of satisfaction in the view from their picture window of friends and neighbors participating in water orientated activities.

Wildlife abounds in the many marshes and oxbows along the Pecatonica bottom.

Hononegah Forest Preserve has a mature stand of white pines rivaled only by White Pines State Park. The varied habitat at Rock Cut State Park has made it a natural for observation of a wide variety of flora and fauna. It is visited by no less than 200 species of bird life including the primeval loon and our national emblem, the bald eagle. The sand ridge country along the Sugar River features the exotic floral displays of lupines and other plants found nowhere else in the county. The many small pine plantations located in the county are used by wintering flocks of long-eared owls, cardinals and nuthatches. Access, or more appropriately the lack of it, severely limits the general public's ability to participate in this form of outdoor activity; however, too much access sends the animals away.

The Department of Conservation has in recent years, as have forest preserve, park and school districts, become acutely aware of the need for outdoor education. Naturalists who set up displays, conduct classes and lay out nature trails are now stationed at 10 state parks including Rock Cut, and also in some county preserves. Realizing the need to make the public more aware of their environment, the Rockford Board of Education in conjunction with the Rockford Park District inaugurated an outdoor education program in 1967. While the main base of operations is at Atwood Park, the teachers conduct classes at both Atwood Homestead Forest Preserve and Rock Cut State Park and in other natural settings. During the summer of 1971, an Interpretive Education Program will be launched at Rock Cut. The Boys' Penal Farm School in Durand has initiated an outdoor awareness program which has been a rousing success, interesting incarcerated youth in something other than self gratification. All of these programs are helping to bridge the gap between urban society and the land from which it originated.

SURFACE WATER PROBLEMS

In the past decade, we have been witnesses to great public awakening and concern with the problems of water pollution. Detergent foaming, noxious odors, sludge beds and blooms of plankton algae all interfere with the recreational usage of our surface waters and have been important stimuli for awakening the general public to the problem of pollution. In the following section, we shall discuss pollution, water level fluctuation, usage competition and stream alteration as related to surface water resources of Winnebago County.

POLLUTION

Winnebago County's water areas are not grossly polluted at this time, but there have been quite a few reports of the existence of pollutional problems on the county's streams over the past 20 years. There have also been many instances where these situations have occurred and gone unreported due to the fact that the observer did not know who to inform. Fish mortalities traceable to pollution have occurred on five of the county's streams in past years and in some cases have been severe.

Table 22 is a compilation of the occurrence in Winnebago County of known fish mortalities which have been reported to and investigated by Illinois Fisheries personnel since 1958.

The Kishwaukee, Pecatonica and Rock rivers all have sewage plants located along their shores as do Otter, Coolidge and Mill creeks. Fish mortalities have in most cases occurred below the outfalls of these plants. The concentration of metal plating plants (over 50) in the city of Rockford had caused a severe overloading on the Kishwaukee Street Treatment Plant, which culminated in five disasterous fish mortalities in the Rock River during the droughty summer of 1963. Much of cyanide is now being reused due to the installation at some of the larger plants of reclaiming equipment. Those plants which cannot afford this process now have waste, heavy metals and cyanides hauled to a tank railroad car for shipment to Kansas City and eventual destruction. Cyanide discharges from the Rockford Plant have consequently dropped from 7.0 ppm in 1963 to less than 1 ppm in 1970.

The largest mortality ever in the county occurred on the Pecatonica River in February, of 1969; however, ice cover kept it from our knowledge until March 17. Other mortalities have been caused by the discharge of dairy waste into a stream. The causes of these mortalities have been varied, in some cases unavoidable; however, a few mortalities can be traced to outright negligence.

As can be seen in Table 22, 11 major fish mortalities have occurred in Winnebago County since 1958, causing an estimated total loss of 369,123 fish valued at $100,764.17. The mortalities which have occurred on the Rock River along with a general lowering of water quality could be one of the major reasons for the reported decline in the catch rate for smallmouth bass and other gamefish in recent years.

Table 23 presents data pertinent to the average water quality of some of the major waterways of Winnebago County. In most cases, this data represents a comparison of the averages of sampling for the 10 year period prior to 1969 to values gathered for that year at eight different monitoring stations located in the county.

TABLE 22

INCIDENCE, NUMBER AND VALUE OF KNOWN FISH MORTALITIES, WHICH HAVE OCCURRED ON THE STREAMS OF WINNEBAGO COUNTY SINCE 1958 *

Date	Stream	Estimated No. Fish Lost	Value of Fish Lost	Cause of Mortality	Location to Nearest Town
5/21/58	N. Fork Kent Creek	N.A.	N.A.	Chemicals	Page Park
6/8/63	Otter Creek	49,434	$2,832.91	Organic	Between Durand & Davis
7/30/63	Rock River	30,907	4,341.92	Metals	Downstream from San. Dist.
8/26/63	Rock River	51,404	5,367.39	Metals	Downstream from San. District
9/7/63	Rock River	3,807	270.09	Chemicals	Sabrook Power Plant
9/13/63	Rock River	44,436	2,353.26	Metals	South of San. District
9/16/63	Rock River	5,321	588.96	Metals	South of San. District
8/5/64	N. Fork of Kent Creek	900	77.96	Chemicals	In Rockford
8/12/64	Rock River	5,575	649.15	Metals	South of San. District
7/19/66	S. Fork of Kent Creek	4,549	114.93	Fertil-izers	Upstream from Levings Lake
3/17/69	Pecatonica River	172,790	84,167.60	Unknown	Downstream fr Pecatonica
Totals		369,123	$100,764.17		

N.A. - No Assessment Made

* - Source of Data - Illinois Department of Conservation Northeastern Fisheries Area Files.

Four of the stations are located on the Rock River. The station at the Beloit Bridge represents the State of Wisconsin's average contribution to the pollutional load of the Rock River. As can be seen from the table, the river is already in an enriched state as it enters Illinois with both unacceptable B.O.D.'s and bacterial levels. This load is dissipated somewhat by the time the river reaches Rockton, due in part to the aeration received via the Rockton dams, to wit, the acceptable B.O.D. and lowered bacterial levels for the Blackhawk Blvd. station.

At this point the water of the Pecatonica River is added. The two stations on the Pecatonica River both show acceptable B.O.D. levels; however, bacterial levels are fairly high indicating that disinfection is a must. The Freeport sewage treatment plant installed secondary treatment and chlorination in 1968. The Pecatonica sewage treatment plant began chlorinating about the same time. Rockton is presently installing secondary treatment and chlorination will follow. The village of Durand will have installed tertiary treatment and chlorination by 1971. Their discharge is reflected somewhat by the station located at Harrison.

The next two sampling stations are located on the south end of Blackhawk Island, approximately one and one-half miles south of the Rockford Sanitary District Plant. One station is located on the west side of Blackhawk Island and the other along the East Channel. The Middle Channel station has been classified by William Tucker, a biologist with the Enfironmental Protection Agency, as a balanced aquatic habitat; however, the East Channel is classified as polluted having a septic odor and bottom sledge deposits with very little aquatic life. This channel receives almost the total flow from the Rockford Sanitary District due to the current in the Rock River and since it is the smaller of the two channels, it tends to load up with sewage residues. This channel is also the scene of most of the Rock River fish mortalities which have occurred in the past 10 years. Suspended solids get quite high in this area and up to 1969 exceeded the standard set by Illinois Environmental Protection Agency. This station also had a 10 year average B.O.D. of seven. The Rockford Sanitary District is presently upgrading their facilities and is installing secondary treatment. They became chlorinated in 1968 and the 1969 figures show a marked decrease in suspended solids and also bacterial levels.

There are several sampling stations on the Kishwaukee River; however, only the New Milford Station is presented here since it represents the total input to the Kishwaukee received by Winnebago County. The Kishwaukee is a relatively clean stream. It has the second highest level of suspended solids, much of which is silt washed in from farm lands during times of heavy runoff. Cherry Valley, which is upstream from this station, has recently installed a new sewage treatment plant and in 1969 began chlorination. The effect of this can be seen from the much reduced bacterial levels expressed in the 1969 collections.

The Kilbuck Creek station at Route 51 shows the lowest B.O.D. of any area in the county. This would be expected as there are no large towns on the watershed. Moderately high levels of fecal streptococcus have occurred at this station in both 1968 and 1969 and the author is at a loss to explain its presence.

Figure 22 shows the status of pollution abatement in Winnebago County as of 1970. Most of the counties existing sewer plants are upgrading their facilities and some localities are putting in new plants. Lake Summerset will, once it becomes developed, have a sewage facility located below the dam and will discharge into Otter Creek. With the establishment in 1970 of a regional Environmental Protection Agency office in the city of Rockford, progress toward pollution abatement and evaluation of pollutional discharges should be greatly facilitated in the future.

TABLE 23

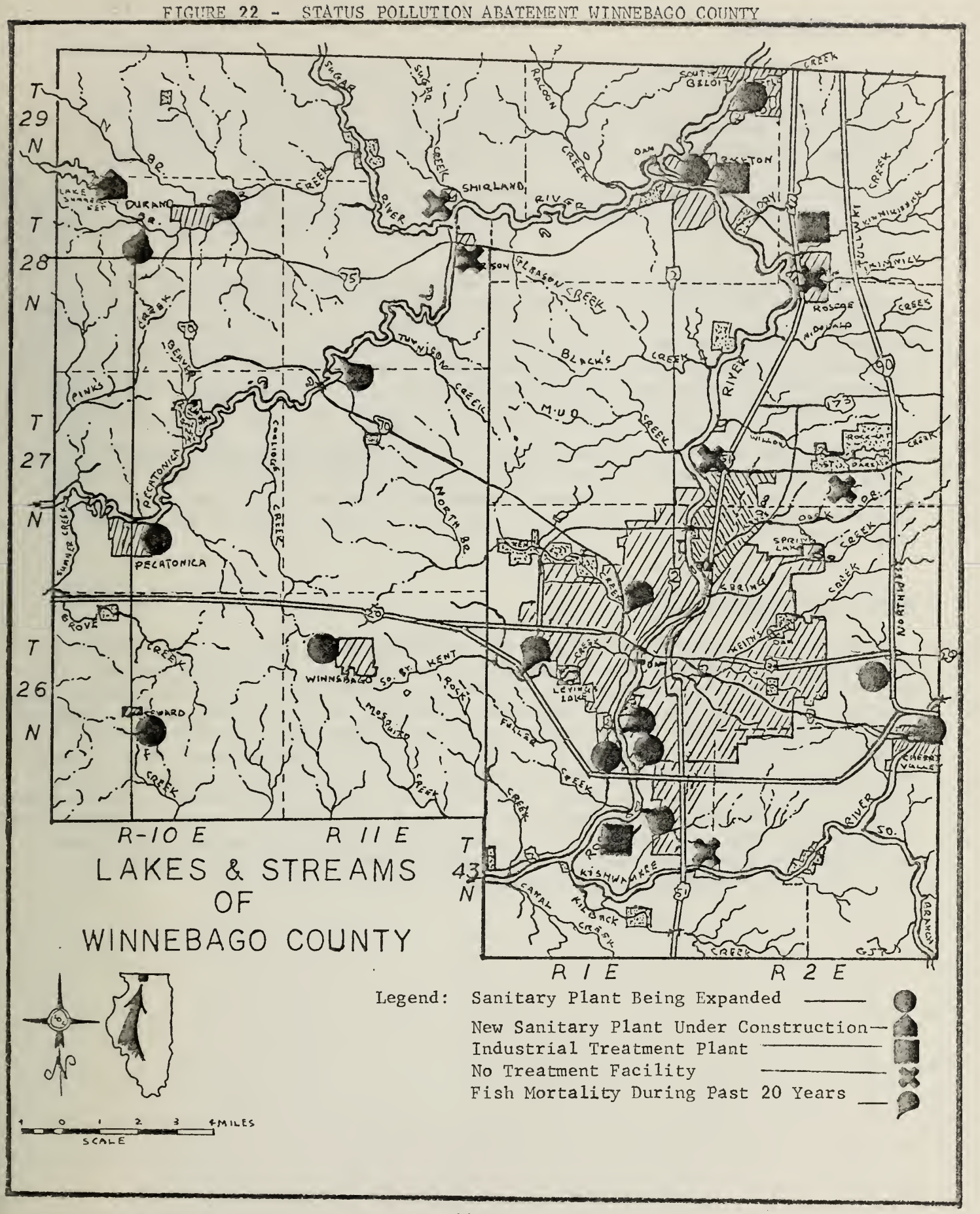
AVERAGES OF WATER QUALITY DATA COLLECTED ON WINNEBAGO COUNTY STREAMS BY THE ILLINOIS SANITARY WATER BOARD FOR THE PERIOD FROM 1958 to 1968 AND IN 1969*

Stream & Location	Period Sampled	No. of Samples	D.O. ppm	Total Suspended Solids	B.O.D.	Bacteria/100 ml Coliform	Fecal Coliform	Fecal Strepto
Rock River - Beloit	1958 to '68	39	10.5	384	6	39,877	100	1,035
Stateline Bridge	1969	8	10.1	348	N.D.	44,625	5,900	731
Rock River - Rockton Blackhawk Blvd. Bridge	1964	12	10.0	336	4	11,550	6	N.D.
Rock River - E. Channel	1958 to '68	38	9.7	631	7	249,698	93,000	42,766
Beltine Bridge	1969	8	9.9	377	N.D.	129.625	150,000	12,437
Rock River Middle Channel	1958 to '68	38	11.1	360	5	23,150	250	1,619
Beltine Bridge	1969	8	10.6	322	N.D.	14,000	4,600	582
Kishwaukee River Main Stream - New Milford,	1958 to '68	34	11.3	427	5	5,604	2,200	1,336
U. S. Rt. 51 Bridge	1969	8	9.8	400	N.D.	3,127	40	601
Kilbuck Creek	1958 to '68	37	11.8	394	1	4,827	100	1,832
Rt. 51 Bridge	1969	8	11.3	371	N.D.	7,571	10	3,713
Pecatonica River	1958 to '68	37	8.6	351	2	17,275	500	2,487
Pecatonica Road Bridge	1969	7	8.6	341	N.D.	21,428	5,100	3,840
Pecatonica River	1958 to '68	36	9.1	347	3	4,455	700	1,831
Harrison	1969	7	8.7	349	N.D.	11,714	535	795
Water Quality Standards Set For Intra-state Streams	1967		4.0	500	1.0 to 3.0	5,000	Presence indicates recent pollution.	

N. D. - No Data Available

* - Source of Data - Klassen, Clarence W., et al. 1966-1968-1969-1970. Illinois Water Quality Network, Part III - Mississippi, Kaskaskia, and Rock rivers Illinois. Department of Public Health, Springfield, Illinois.

FIGURE 22 - STATUS POLLUTION ABATEMENT WINNEBAGO COUNTY



Legend: Sanitary Plant Being Expanded

New Sanitary Plant Under Construction

Industrial Treatment Plant

No Treatment Facility

Fish Mortality During Past 20 Years

USAGE COMPETITION

The usage of surface waters by high powered speed boats, large outboards, in-board-outboards, water jets, airboats and those towing water-skiers is in direct competition with many other water-based activities. The amount of space required to engage in this form of boating is considerable. None of Winnebago County's lakes are large enough to accommodate these activities on even a small scale.

The intensity of power boating on the Fordam pool of the Rock River is already so far beyond it logical capacity that several Conservation Department Inspectors are required to patrol it.

On its own conservation lakes the Illinois Conservation Department has set guidelines which could serve as a rule of thumb for all agencies endowed with powers over water areas. These guidelines are as follows: (1) No motors are allowed on water areas less than 60 acres with the exception of electric trolling motors; (2) On lakes of 60 acres or more, a ten horsepower limit is enforced; (3) Power boating is restricted to impoundments exceeding 500 acres and buoyed no-wake fishing areas are established to protect both the rights of anglers and other recreationists.

Most large water craft have marine toilets and are designed for travel on very large waters. In inland lakes these toilets should be sealed because of the low dilution factor. Careful diligence is required to enforce this type of ruling so that those most acutely affected don't add to our already enormous pollutional problem.

WATER LEVEL FLUCTUATION

Excessive short term rainfall, snow meltwater, tilling agricultural land, draining sloughs and potholes, ditching and straightening streams and drought, all have their affect on levels on both surface and subsurface waters. Fluctuating water levels can have detrimental and sometimes beneficial affects on the various types of aquatic life. In times of high water, areas are flooded which produce spawning, nesting and feeding areas for many forms of life. If the water level drops suddenly, many organisms including fish become stranded and die. To some species, such as northern pike, the result is almost complete loss of the year's spawn. To other species such as mink, wading and shorebirds, it exposes a rich supply of food organisms. This is one of nature's many checks and balances which help to keep animal populations from exceeding their food supply. Every spring some flooding occurs along the Kishwaukee and Pecatonica rivers in Winnebago County.

STREAM ALTERATION

During the past 50 years, many "improvements" have been made on the streams of our nation. Steam shovels, dredges, bulldozers and turn-a-pulls have all played a part in shaping the present character of our streams. In his haste to shape the water course to suit his own needs, man has dredged out natural stream beds and piled the exposed overburden on the banks; leaving it in many cases to erode back into the stream soon after. This practice often causes silting-in of many productive pools and much gravel bottom rich in aquatic life.

Most natural water courses develop along the lines of least resistance and thus they often meander in snake-like fashion back and forth within the confines of their valley. This type of development fosters the creation of an alternating series of riffles and pools. Over the millennia of time, fish and invertebrate forms have evolved which are best suited to and often restricted to the natural stream environment. When man alters a stream ecosystem by channelizing, straightening or even impounding, he more often than not disrupts the delicate balance in nature's web of life and creates conditions unfavorable to the survival of many stream organisms. In Winnebago County some stream alteration has already occurred on Otter, Grove, Sumner and Canal creeks and dams exist on both the Rock and Pecatonica rivers.

THE FUTURE

Most of the problems associated with water management and multiple-use water-orientated recreation could be readily solved if they were dealt with by planning and other governmental agencies as are associated land-use conflicts. Much could be accomplished in the ensuing years if a fuller measure of cooperation existed between local, county and state agencies charged with planning and implementing the development of our future recreational lands. Winnebago County is presently leading the pace in northcentral Illinois with its active program of acquisition of recreational lands. Rock Cut State Park is being enlarged to 3,000 acres; the Beloit marsh and Elliot prairie are being acquired. The Forest Preserve District just purchased a new preserve in Harlem Township; and the Rockford Park District recently developed Elliot Golf Course. This land will be irreplaceable in the future as the areas' population and leisure time increase.

As for future needs and priorities, the development of at least two more large public recreational lakes is imperative. One of these is needed immediately and another by the year 2000. The Rock and Kent creek sites are strategically located and should be given first consideration. Exotic natural areas such as the Sugar River sand banks and the Amblystoma meadow ought to be acquired and preserved in the natural state. More angling access ought to be provided along the Kishwaukee and Pecatonica rivers. DeFilippis (et al. 1969) states that a total of 5,873 acres of new recreational land will be needed by 1985. He estimates that this acquisition will cost approximately 14,000,000 1968 dollars.

A county clean streams' committee should be formed and consist of persons from all walks of life, including sewer plant operators. The utmost in phosphate removal ought to be required of plants discharging their wastes into recreational waterways. Sound land management ought to be required of property owners on the upper reaches of the county's watersheds.

Public land holdings, which are not to be developed for heavy recreational utilization, should be intensively managed for timber and wildlife production. Those wildlands and waters ought to be gleaming examples showing what can be done if modern renewable resource management techniques are applied, suffice it to say at present this is not the case. Provisions for limited hunter access on these lands should be made, where applicable.

Enlightened zoning and continued public land acquisition at all levels of government can, if implemented in the near future, help solve these problems on the land. Laws with adequate means for enforcement may be required to mediate conflicts on the water. The costs of solving water management problems and purchasing recreational lands are geometrically increasing with every passing year.

SOURCES OF DATA

1. Aerial Photography - Agricultural Stabilization and Conservation Services.
2. Climatological Data - U. S. Weather Bureau, State Climatologists Madison and Urbana.
3. Conservation Department Files (Springfield).
4. Department of Business and Economic Development.
5. Environmental Protection Agency - Personal Communications.
6. Department of Registration and Education - Publications.
7. Illinois Geologic Survey Bulletins.
8. Illinois Sanitary Water Board Reports.
9. Illinois Water Survey Bulletins.
10. Northeastern Fisheries Area - County Water Files.
11. Rockford City - County Regional Planning Commission
12. Resource Agency Interviews - County Level.
13. Soil Survey Data - U.S.D.A. Soil Conservation Service
14. Topographical Maps - U. S. Geologic Survey.
15. Newspaper Clippings - Rockford Register Republic, Inc.
16. Rockford Park District - Personal Communications.

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APPENDIX NO. 1

FISHES OF THE KISHWAUKEE RIVER AND THEIR FREQUENCY OF OCCURRENCE AT THE KISHWAUKEE FOREST PRESERVE DURING FOUR SAMPLING PERIODS 1960 to 1965.

Date	7-7-'60	6-5-61	10-9-61	7-15-65	Total
Sampling Time	141 min.	165 min.	106 min.	50 min.	
Species					all Stations
			Game Fish		
Walleye	32	2	5	0	39
Northern Pike	0	0	1	0	1
Grass Pickerel	1	0	1	0	2
Largemouth Bass	1	0	0	0	1
Smallmouth Bass	165	143	154	21	483
Rock Bass	11	32	13	6	62
Black Crappie	4	5	0	0	9
Bluegill	2	0	0	1	3
Green Sunfish	13	0	0	1	14
Orange-spotted Sunfish	4	0	0	0	4
Channel Catfish	2	3	8	2	15
Black Bullhead	1	0	0	4	5
			Commercial Species		
Carp	27	0	0	20	47
Quillback Carpsucker	33	0	0	54	87
White Sucker	11	0	0	20	41
N. Redhorse Sucker	132	0	0	145	277
Hogsucker	17	0	0	6	23
			Forage Species		
Bluntnose Minnow	3	0	0	9	12
Stoneroller	0	0	0	13	13
Golden Shiner	1	0	0	1	2
Common Shiner	7	0	0	198	205
Creek Chub	5	0	0	0	5
Redfin Shiner	1	0	0	23	24
Sand Shiner	0	0	0	264	264

APPENDIX NO. 1

Continued

FISHES OF THE KISHWAUKEE RIVER AND THEIR
FREQUENCY OF OCCURRENCE AT THE KISHWAUKEE
FOREST PRESERVE DURING FOUR SAMPLING PERIODS 1960 to 1965

Date Sampling Time Species	7-7- '60 141 min.	6-5- '61 165 min.	10-9- '61 106 min.	7-15- '65 50 min.	Total all Stations
Bigmouth Shiner	0	0	0	13	13
Spotfin Shiner	0	0	0	92	92
Roseyface Shiner	0	0	0	6	6
Iowa Darter	0	0	1	0	1
N. Brook Lamprey	0	0	Many	0	Many
Total P/Station	473	185	183	899	1740

29 Species

APPENDIX NO. 2

FISHES OF THE PECATONICA RIVER AND THEIR FREQUENCY OF OCCURRENCE AT FOUR SAMPLING LOCATIONS 1960 to 1970

Date Location Sampling Time Species	7-22-'60 Ridott 81 min.	5-5- '70 Pecatonica 80 min.	7-21- '60 Harrison 35 min.	7- '60-8- '63 Rockton 146 min. + Rot.	Grand Total All Collections
Walleye	7		15	73	95
Northern Pike	-	6	2	6	14
Smallmouth Bass	3		1	20	24
Largemouth Bass	7		-	4	11
White Crappie	-		3	1	4
Black Crappie	-		3	29	32
Rock Bass	-		-	1	1
Bluegill	81		0	28	109
Pumpkinseed Sunfish	-		-	1	1
Orange Spotted Sunfish	2		1	1	4
Channel Catfish	5	7	14	72	98
Flathead Catfish	1		Many in kill '69	-	1
Yellow Bullhead	1		-	-	1
COMMERCIAL SPECIES					
Carp	100	15	29	100	244
Goldfish	2	-	-	-	2
Bigmouth Buffalo	5	Many	3	10	18
Smallmouth Buffalo	2			1	3
Quillback Carpsucker	-	19	-	18	37
River Carpsucker		5		1	6
Northern Redhorse	15	1	20	100	136

APPENDIX NO. 2 continued

FISHES OF THE PECATONICA RIVER AND THEIR FREQUENCY OF OCCURRENCE AT FOUR SAMPLING LOCATIONS 1960 to 1970

Date Location Sampling Time Species	7-22- '60 Ridott 81 min.	5-5- '70 Pecatonica 80 min.	7-21- '60 Harrison 35 min.	7- '60 + 8- '63 Rockton 146 min. + Rot.	Grand Total All Collections
			COMMERCIAL SPECIES		
Golden Redhorse	2		2	5	9
Hog Sucker				1	1
White Sucker	8			1	9
			FORAGE SPECIES		
Stonecat	-	-	-	2	2
Common Shiner	Many	-	-	many	many
Bluntnose Minnow	Many	-	-	many	many
Suckermouth Minnow	-	-	-	2	2
Spotfin Shiner	-	-	-	1	1
Sand Shiner	-	-	-	1	2
Redfin Shiner	Many	1	many	many	many
Bluntnose Minnow	Many	-	-	many	many
Lake Emerald Shiner	-	10	-	-	10
Jonny Darter	-	-	-	1	1
Totals per Station	239	65	93	480	878

APPENDIX NO. 3

FISHES OF THE ROCK RIVER AND THEIR FREQUENCY OF OCCURRENCE AT TWO SAMPLING LOCATIONS 1960-1970

Date Location Sampling Time Species	6-7- '60 Up Stream Rockton Dam 110 min.	7-1- '65 Below Rockton Dam 60 min.	10-22- '68 7-18- '69 Fordam Pool 107 min.	6-9- '60 8-19- '68 Below Fordam Dam 100 min.	Total All Stations
			Game Species		
Walleye	21	0	0	8	29
Northern Pike	1	0	3	0	4
Largemouth Bass	0	0	2	2	4
Smallmouth Bass	0	0	17	22	39
Rock Bass	1	0	0	8	9
Yellow Perch	0	2	0	1	3
White Crappie	0	0	4	5	9
Black Crappie	7	0	6	10	23
Bluegill	8	0	11	7	26
Pumpkinseed	38	24	3	0	65
Green Sunfish	9	20	1	2	32
Orange-Spotted Sunfish	0	0	1	3	4
Channel Catfish	0	0	4	24	28
Flathead Catfish	0	0	0	2	2
Yellow Bullhead	0	0	0	5	5
Brown Bullhead	5	0	0	0	5
Black Bullhead	6	5	0	4	15
White Bass			4	2	6
			Commercial Species		
Carp	122	259	25	154	560
Goldfish	0	0	1	2	3
Bigmouth Buffalo	12	19	9	1	41
Smallmouth Buffalo	7	0	0	0	7

APPENDIX NO. 3 continued

FISHES OF THE ROCK RIVER AND THEIR FREQUENCY OF OCCURRENCE AT TWO SAMPLING LOCATIONS 1960-1970

Date Location Sampling Time Species	6-7-'60 Up Stream Rockton Dam 110 min.	7-1-'65 Below Rockton Dam 60 min.	10-22-'68 7-18- '69 Fordam Pool 107 min.	6-9-60 8-19-68 Below Fordam Dam 100 min.	Total All Stations
		Commercial Species			
Quillback Carpsucker	32	7	58	47	144
River Carpsucker	6	0	4	0	10
White Sucker	92	10	7	95	204
Hogsucker	0	0	0	3	3
No. Redhorse	38	140	12	58	248
Golden Redhorse	0	19	3	1	23
Silver Redhorse	0	0	2	0	2
Freshwater Drum	1	0	10	20	31
Longnose Gar	3	0	0	1	4
Dog Fish	1	0	0	0	1
		Forage Species			
Bluntnose Minnow	0	3	0	5	8
Fathead Minnow	0	3	0	0	0
Bullhead Minnow	0	0	25	0	25
Hornyhead Chub	0	0	0	1	1
Gravel Chub	0	0	0	3	3
Golden Shiner	12	1	0	0	13
Sand Shiner	0	1	27	53	81
Spotfin Shiner	0	2	19	49	68
Spottail Shiner	0	5	6	0	11
Common Shiner	0	0	0	2	2
L. Emerald Shiner	0	0	13	167	180
Rosyface Shiner	0	0	0	2	2
Stone Cat	0	0	0	1	1
Tadpole Madtom	0	0	0	5	1
Logperch	1	0	0	0	1
N. Brook Lamprey	0	0	0	5	5
Total/Station	423	520	277	780	2000

Total - 48 Species

APPENDIX 4

FISHES OF THE SUGAR RIVER AND THEIR FREQUENCY OF OCCURRENCE AT TWO SAMPLING LOCATIONS 1960 to 1963

SPECIES	Date Location Sampling Time	7-21-1960 (2 mi. upstream (from mouth 97 minutes	8-29-1963 Forest Preserve 60 minutes	Grand Total All Collections
		GAME SPECIES		
Walleye		21	0	21
Northern Pike		8	1	9
Largemouth Bass		1	1	2
Smallmouth Bass		0	9	9
White Crappie		1	0	1
Black Crappie		7	0	7
Bluegill		14	1	15
Warmouth Bass		15	0	15
Pumpkinseed		5	0	5
Green Sunfish		0	18	18
Orange Spot Sunfish		1	3	4
Channel Catfish		11	70	81
		COMMERCIAL SPECIES		
Carp		64	0	64
Bigmouth Buffalo		12	0	12
White Sucker		8	0	8
Northern Redhorse		70	10	80
Golden Redhorse		21	6	27
Quillback Carpsucker		27	49	76
		FORAGE SPECIES		
Common Shiner		0	480	480
Hornyhead Chub		0	20	
Slenderheaded Darter		0	3	
N. Brook Lamprey		0	3	
Totals Per Station 22 Species		278	674	952

APPENDIX 5

PHYSICAL DATA FOR POTENTIAL RESERVOIR SITES SHOWN IN FIGURE NO. 9

Taken from Potential Surface Water Reservoirs of Northern Illinois, by Dawes and Terstriep, 1967

SITE of WATERWAY LOCATION	Spillway ELEVATION (Ft.)	Pool Area (acres)	Storage (Acre/feet)	Storage (M.G.)	Watershed (sq.mi.)	Times Filled Per Year	Depth at Dam (ft.)	Length of Dam (ft.)	Earth Fill (1000 sq.yds.)	Shoreline (Mi.)	Mean Annual Runoff (M.G.D.)
1.) N. Br. Otter Creek NE¼ 31-29N - 10E (Pecatonica Quad.)	830.0	326.0	4,300.0	1,400.0	8.2	0.9	40.0	1,600.0	380	9	3.47
2.) Grove Creek		70.0	?	?	1.2	?	30.0		?	?	?
3.) Coolidge Creek NW¼ 31 - 27N-11E (Pecatonica Quad.)	800.0	262.0	2,200	700.0	8.3	1.8	25.0	1,300.0	179	10	3.51
4.) N. Fk. Kent Creek (Rockford Quad.)	778.0	185.0	?	?	?	?	45.0	?	?	?	?
5.) E. Fk. Mill Creek NE¼ 7-25N - 11E (Oregon Quad.)	780.0	141.0	1,900.0	600.0	7.4	1.6	40.0	1,000.0	264	4	2.79

6.) Mosquito Creek SE¼ 2-25N-11E (Kings Quad.)	760.0	173.0	3,500.0	1,100.0	6.2	?	60.0	1,700.0	792	6	2.34
7.) Rock Creek NW¼ 20-26N-1E (Kings Quad.)	740.0	237.0	3,200.0	1,000.0	7.7	1.0	40.0	700.0	176	5	2.99
8.) Keith's Creek (Rockford Quad.)		100+	?	?	1.5	?	45.0	600.0	?	?	?
9.) N.Fk. Willow Creek (Belvidere Quad.)		85.0	900	?	0.2	0.3	40	500	?	?	?
10.) S. Kinnikinnick Creek SE.¼ 31-46N-3E (Belvidere Quad.)	880.0	237.0	3,200.0	1,000.0	9.8	1.3	40	700	127	3	3.81
11.) S. Kinnikinnick Creek Ctr. 35-46N-2E (Belvidere Quad.)	840.0	83.0	1,100.0	400.0	3.6	1.4	50	700	232	2	1.40
12.) N. Kinnikinnick Creek E½26- 46N - 2E (Belvidere Quad.)	840.0	486.0	8,100.0	2,600.0	15.3	0.8	50	900	298	8	5.94
13.) Beaver Run (Pecatonica Quad.)		30.0	?	?	0.2	?	20	400			
14.) N. Br. Otter Creek 27 N - 10 E (Pecatonica Quad.)	850.0	150.0	?	?	2.0	?	45	800	?	?	?

APPENDIX 6

A PROVISIONAL LIST OF THE AQUATIC PLANTS OCCURRING IN WINNEBAGO COUNTY BASED ON COLLECTIONS MADE FROM 1965-1969

Common Name	Scientific Name
Water Plantain	Alisma Subcordatum
Coontail	Ceratophyllum Demersum
Chara	Chara Sp.
Elodea	Elodea Canadensis
Common Waterweed	Elodea Occidentalis
Water Stargrass	Heteranthera Dubia
Common Duckweed	Lemna Minor
Parrot Feather	Myriophyllum Heterophyllum
Southern Naiad	Naias Guadalupensis
White Water Lily	Nymphaea Tuberosa
Water Smartweed	Polygonum Fluitans
American Pondweed	Potamogeton Americanus
Curlyleaf Pondweed	Potamogeton Crispus
Leafy Pondweed	Potamogeton Foliosus
Sago Pondweed	Potamogeton Pectinatus
Small Pondweed	Potamogeton Pusillus
Collapsing White Water Buttercup	Ranunculus Trichophyllus
Water Cress	Rorippa Nasturtium
Swamp Dock	Rumex Verticilatus
Arrowhead	Sagittaria Sp.
Cattail	Typha Latifolia

APPENDIX 6 (CONTINUED)

Common Name	Scientific Name
Common Bladderwort	Utricularia Vulgaris
Eel Grass	Vallisneria
Watermeal	Wolffia Columbiana
Horned Pondweed	Zannechellia Palutris

Source of Data: Special Fisheries' Report No. 11; Aquatic Plants Survey, Department of Conservation, Division of Fisheries, Springfield, Illinois, 1965.

District Biologist County Water File.

APPENDIX 7

A SUMMARY OF WINNEBAGO COUNTY SALES FOR BOATING, FISHING, HUNTING AND TRAPPING LICENSES FOR THE PERIOD 1950-1970*

Year	Resident Sport Fishing Licenses (Including over-age 65 Sales) Since 1961	Resident Small Game Hunting Licenses	Resident Furbearer Trapping Licenses	Resident Licensed Boats (All Types)
1970	-------	-------	--	4,951
1969	19,281	9,351	80	5,915
1968	21,828	7,921	84	5,645
1967	20,070	11,019	81	4,843
1966	20,402	9,985	95	4,534
1965	19,425	9,047	74	4,519
1964	18,271	9,441	62	4,320
1963	18,934	8,876	69	4,265
1962	17,094	9,047	64	3,894
1961	14,996	9,002	57	
1960	13,660	9,999	69	No Licensing
1959	13,575	11,157	46	
1958	15,457	12,058	79	Prior To
1957	18,277	13,375	75	
1956	18,145	14,142	95	1961
1955	18,879	13,109	101	
1954	18,005	12,623	114	--
1953	18,068	13,136	159	--
1952	16,728	11,610	137	--
1951	16,189	12,265	81	--
1950	3,702	3,904	70	--

* Source of Data - Division of Accounting
Illinois Department of Conservation
Springfield, Illinois

APPENDIX 8

CONTRACT COMMERCIAL FISHERIES CATCHES IN POUNDS FOR THE ILLINOIS' PORTION OF THE PECATONICA AND ROCK RIVERS FROM 1952 to 1970

Year	ROCK RIVER				PECATONICA RIVER	
	Carp	Buffalo	Carpsuckers	Other Suckers	Carp	Buffalo Spp.
1970						
1969	59,658	99,163	31,946	---	5,333	3,312
1968	31,035	91,030	21,214	200	8,351	4,289
1967	59,609	90,332	14,592	150	24,252	6,074
1966	28,418	48,650	27,875	481	-----	-----
1965	30,418	69,773	37,915	551	13,795	8,720
1964	59,359	68,764	60,372	1,402	15,030	7,700
1963	80,769	114,822	91,750	310 Gar	-----	-----
1962	83,162	164,988	37,392	696	13,125	14,960
1961	47,452	95,987	37,190	3,304	11,225	-----
1960	29,660	34,252	9,847	1,356	9,930	14,160
1959	41,958	39,040	500	3,290	158,783	-----
1958	37,553	36,403	-----	400 Catfish	8,500	3,100
1957	37,646	37,644	-----	---	6,300	6,390
1956	27,656	24,646	-----	---	3,730	3,360
1955	37,702	25,312	2,300	2,012		
1954	39,867	36,792	-----	---	Data Not Available	
1953	28,234	23,571	-----	---	Prior to 1956	
1952	7,617	5,209	-----	---		
1951	Data Not Available Prior					
1950	to 1952					
Total Poundages For Period	768,363	1,106,478	363,046	12,746	278,354	71,527

Grand Total During Record Period: Rock River - 2,250,633 Pounds
Pecatonica River - 349,881 Pounds

Source of Data: Illinois Department of Conservation, Division of Fisheries, Springfield, Illinois.

APPENDIX 9

A SUMMARY OF ATTENDANCE AT ALL STATE PARKS SINCE 1956
AND ROCK CUT STATE PARK FOR PERIOD - 1962 to 1970
INCLUDING BOAT RENTALS AND CAMPERS VISITATIONS

Year	Statewide Park Attendance	Attendance Rock Cut State Park	Boat Rentals at Rock Cut State Park	Camper Visitation at Rock Cut State Park
1976				
1975				
1974				
1973				
1972				
1971				
1970	24,211,253	1,331,162	4,756	38,059
1969	22,279,858	1,363,760	5,164	40,846
1968	22,391,564	742,474	6,194	39,639
1967	20,343,982	613,097	6,076	32,507
1966	19,879,961	604,676	4,519	28,688
1965	17,982,381	631,284	4,192	28,339
1964	15,974,320	761,811	1,500	16,599
1963	13,222,701	84,576		7,759
1962	10,849,299	44,504	Data Not Available For Years Prior To 1963	Data Not Available Prior To The Park's Opening In 1963
1961	9,574,176	Data Not Available Prior to The Park's Opening In 1962		
1960	8,377,779			
1959	8,524,976			
1958	9,981,449			
1957	11,823,529			
1956	10,099,628			

* Source of Data - Illinois Department of Conservation, Division of Parks and Memorials, Springfield, Illinois.

GLOSSARY

ACRE FOOT - An area of one acre covered to a depth of one foot. One acre foot is 43,560 cubic feet or 325,851 gallons of water.

AESTHETICS - The overall scenic attraction of a lake setting; natural beauty of shore and waters, or any unusual natural phenomena; the appeal of its wildlife and aquatic plants.

ALGAE BLOOM - A bloom of algae (microscopic plants) may be so dense that it imparts a greenish, yellowish or brownish color to the water.

ALKALINITY - Ordinarily expressed as a pH above 7. Most water in the alkaline class has a range from pH 7.6 to 10.0. Alkalinity may be expressed as the amounts of carbondates, bicarbonates, and hydroxides present in the water.

ALLUVIUM - The sediments, or detrital matter, carried by inflowing streams and deposited on lake bottoms.

ANTICLINE - An arch of stratified rock in which layers bend downward in opposite directions from the crest.

AQUATIC PLANTS - Plants whose seeds germinate in the water or in the lake bottom soil; those that grow in water and are commonly grouped as floating, submersed and emersed.

AQUIFER - Any geological formation containing water, especially one which supplies the water for wells and springs.

ARTIFICIAL IMPOUNDMENT - Basins purposely excavated by man and filled with water by catchment from runoff, by pumping or by diversion of natural water bodies.

BASE FLOW - Flow in a stream when no runoff or precipitation is taking place.

BOD - The abbreviation for biochemical oxygen demand which is a measure of the amount of water soluble oxygen required by microscopic organsims to decompose a given amount of organic material in a specific amount of time.

COD - Abbreviation for chemical oxygen demand which is a measure of the chemically oxidizable organic matter in a given sample of water. The ratio between the BOD and COD is an indication of the relative proportion of biologically available organic matter in a given sample.

CARRYING CAPACITY - The maximum number (or weight) or organisms of a given species and quality which can survive in a given ecosystem through the least favorable environmental conditions that occur within a stated interval of time.

COMMERCIAL FISH - Fish that are caught by special tackle and sold.

CREEL CENSUS - Information obtained from anglers on their fishing success. A creel census can give information on fishing pressure, fishing quality, the total number and weight of fish being harvested, and the kind and size of fish being caught.

DERELICT LANDS - Those quarries, gravel pits and strip mines which have been abandoned or are depleted.

DO - An abbreviation for dissolved oxygen which is oxygen available in water for the survival of fish and other organisms.

DRAINAGE BASIN OR AREA - That part of a land area over which runoff water drains to a common point. See watershed.

ECOLOGICAL - Pertaining to the interrelationship of living things and their environment.

ECOSYSTEM - A community of organisms, interacting with one another, plus the environment in which they live and with which they also interact; e.g. a pond, lake, or stream.

EPHEMERAL - Lasting a very short time; short-lived; as applied to water areas - short-lived lakes and ponds.

EPILIMNION - In a thermally stratified lake, the turbulent layer of water that extends from the surface to the thermocline.

ESKER - A serpentine ridge of gravelly and sandy drift, believed to have been formed by streams under or in glacial ice.

EUTROPHICATION - Enrichment of the water or lake soil. Increase in nutrients required for growth of organisms may come about by natural processes or rapid enrichment may take place due to some cause such as the introduction of sewage effluent. Eutrophic lakes are well provided with basic nutrients.

EVAPOTRANSPIRATION - The combined losses from a lake surface due to evaporation, sublimation and transpiration from plant life.

FLATS - Water with slight to moderate current and with an unbroken surface but less depth than pools.

FLOODPLAIN - That part of a lake or stream basin lying between the shoreline and the shore cliff and subject to submergence during a high water stage.

FLUVIAL - Pertaining to streams and rivers.

FORAGE FISH - All small size fish used as food by larger fish.

GLACIAL DRIFT - Material of any sort deposited in one place by glacial action after having been moved from another location.

GLACIAL LAKE - A lake formed as a result of glacial action.

GLACIAL OUTWASH - Deposits made of materials produced by glaciers and carried, sorted, and deposited by water that originated mainly from the melting glacial ice. The deposits now exist as stratified beds of clay, sand or gravel in the form of plaines, valley trains and deltas of old glacial lakes.

GLACIAL PLAINS - Glacial material that has been sorted or stratified by the melt-water of a glacier and is carried and deposited mainly as beds of clay, sand or gravel to form plains.

GLACIAL TILL - A deposit of unstratified earth, sand, gravel and boulders transported by glaciers.

GOB-PILE - The refuse area from a coal processing plant consisting of waste coal by-products, rock material and soil.

GRADIENT - The inclination from the horizontal of the lake bottom beginning at the shoreline. The slope of a stream over a given distance.

GRAVEL PIT - Lakes or ponds formed by the excavation of gravel.

GROUND WATER TABLE - The upper limit of the part of the soil or underlying material wholly saturated with water.

HARDNESS (Water) - That quality in water which is imparted by the presence of dissolved salts, especially calcium sulfate or bicarbonate.

HOMOGENOUS - Composed of parts all of the same kind.

HYPOLIMNION - In a thermally stratified lake, the layer of water below the thermocline and extending to the bottom of the lake. The water temperature is virtually uniform.

IMPOUNDMENT - A body of water ponded or held back by a dam, dike, floodgate or any other barrier.

INTERMITTENT STREAM - A stream having water only part of the time.

KAME - A more or less rounded hill of sand and gravel associated with glacial deposits.

LACUSTRINE DEPOSIT - Materials deposited from lake water.

LAKE - A large body of water surrounded by land. The Illinois Department of Conservation classifies all impoundments six acres or larger as lakes.

LITTORAL ZONE - A narrow zone including both land and water immediately bordering the shoreline of a water area.

LOAM - A rich friable soil containing a relatively equal mixture of sand and silt and a somewhat smaller portion of clay.

LOESS - An unstratified deposit of yellowish-brown loam covering areas in North America, Europe, and Asia, now generally thought to be chiefly a wind-borne deposit.

MARSH - An area where water stands the year-round and is usually abounding in water weeds, cattail, bulrushes and other emersed vegetation.

MGD - An abbreviation for million gallons per day.

MORAINE - A ridge, mound, or irregular mass of boulders, gravel, sand and clay deposited by a glacier.

MORPHOMETRY - Measurements such as depth, length, width, volume, shoreline and bottom gradients of a water area.

NATURAL LAKE - Any large impounded water area not formed by an act of man.

NURSERY STREAM - A tributary stream used by small fish for protection and feeding until they reach maturity.

OXBOW LAKE - A lake occupying the abandoned channel of a looping meander of a river.

PARAMETER - A constant or variable term in a function that determines the specific form of the function but not its general nature.

PERMEABLE SOILS - Soils capable of allowing the passage of water. A porous soil.

pH - The symbol for the logarithm of the reciprocal of hydrogen ion concentration in gram atoms per liter. A pH of less than 7.0 is acid, a pH of 7 nuetral and more than 7.0 is alkaline. pH indicates the acidity or alkalinity of a material.

PHOTOSYNTHESIS - The process by which green plants use sunlight, carbon dioxide and water to produce carbohydrates and oxygen.

PHYSIOGRAPHY - The science of physical geography. A study of the features and nature of the earth surface.

PLANKTON - A term for an assemblage of micro-organisms, both plant and animal, which float, drift or swim in the water and in their movements are subject to wave and current action.

POLLUTION - The presence of any foreign substance in water which tends to degrade its quality so as to constitute a hazard or impair the usefulness of the water.

POND - A small body of water surrounded by land. The Illinois Department of Conservation classifies all impoundments less than six surface acres as ponds.

POOLS - Deeper portions of a stream, usually with a smooth surface and slow flow.

PPM - Abbreviation for parts per million in terms of unit of weight. Used to report the availability or presence of salts, nutrients, gases and toxic materials in water.

PRIMARY PRODUCTIVITY - The rate at which energy is stored by photosynthetic and chemo-synthetic activity of producer organisms (green plants) in the form of organic substances which can be used as food materials.

REHABILITATION - To restore to a good condition. In the case of undesirable fish populations, the population is removed in whole or part in order to restore it to a good condition.

RELIEF - A contour variation of the land surface in relation to the surrounding land.

RIFFLES - Shallow but rapid current over gravel or rubble.

ROTENONE - A plant alkaloid and is the active ingredient in Derris powder, Cube, Barbasco, Akar Tuba and also in the currently available fish toxicants for use in killing fish.

RUNS - Moderate to rapid current flowing in a deeper narrower channel than a riffle but the current is not as turbulent as in a rapid.

SECCHI DISC - A circular plate 20 centimeters in diameter, the upper surface of which is divided into four equal quadrants and so pointed that two quadrants directly opposite each other are black and the intervening ones white. The instrument is used to measure light penetration in water.

SILTATION - The filling of water areas by sediments carried in by inflowing surface water.

SPORT FISH - Any fish that is sought after by anglers using a pole and line.

STRATIGRAPHY - A branch of geology dealing with the classification, nomenclature, correlation and interpretation of stratified rocks.

STRIPMINE LAKE OR POND - Water impoundments resulting from coal mining operations near the surface of the ground.

SUBSTRATE - The bottom deposits of a lake or stream on which organisms may grow.

SYNCLINE - Sloping downward in opposite directions so as to meet in a common point or line. A downward fold or rock strata.

TAILWATER - The portion of a stream immediately below a dam.

TERMINAL MORAINE - A ridge of glacial till marking the farthest advance of a particular glacier.

THERMAL STRATIFICATION - Differences in water temperature from the surface to the bottom in which distinct layers caused by temperature gradients and resulting changes in water density.

THERMOCLINE - The stratum of water in which there is a rapid rate of decrease in temperature with depth; a minimum of one degree Centigrade per meter of depth. The thermocline is located immediately below the epilimnion.

TOPOGRAPHY - The detailed mapping or charting of the features of a relatively small area, district or locality. The relief features or surface configuration of an area.

TURBIDITY - The degree of opaqueness of water due to the amount of fine matter in suspension.

WATERSHED - The whole surface drainage area that contributes water to a stream or impoundment.

WETLANDS - Land features that are permanently wet or intermittently water covered such as swamps, marshes, bogs, muskegs, potholes, swales, glades, slashes, and overflow land of river valleys.

WINTERKILL - Partial or complete loss of fish and animal life of a water area due to the formation of a complete ice cover causing oxygen depletion from water stagnation.

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